

ARCHIVES OF OTOTOLOGY.

STATISTICAL REPORT OF THE EAR PATIENTS TREATED DURING THE YEARS 1893-1896 INCLUSIVE.

By PROF. BEZOLD, MUNICH.

Abridged and Translated by Dr. JULIUS WOLFF, New York.

DURING the years 1893 to 1896 inclusive 5327 ear patients were treated, representing 6056 ear diseases. These were divided among the two sexes as follows:

Male, 56.2 %; female, 43.8 %; whereas Bürkner found that among the ear patients the proportion of men to women was as 6 to 4.

The various parts of the ear were affected as follows:

External ear with tympanic membrane, 22.8 %; middle ear, 63.2 %; inner ear, 14 %.

The distribution of the diseases among the two sexes was:

	Male.	Female.
External ear (including tympanic membrane)...	55.6 %	44.4 %
Middle ear.....	55.7 %	44.3 %
Inner ear.....	59.7 %	40.3 %

In Table I. the author classifies the above patients, 2135 (40 %) of whom were seen in private and 3192 (60 %) in public practice.

In Table II., which is here omitted, the results of Table I. are compared with those for the years 1890-1892 and with the data contained in the *Klinische Jahrbücher*, i.-v. (according to Kruschewsky).

The statistics of the author's practice from the year 1872 to 1892, as well as a detailed report of the years 1890-92, with remarks, are to be found in his highly valuable and

widely known monograph, *Rundschau über den gegenwärtigen Stand der Ohrenheilkunde* (*Review of the Present Position of Otology*), Wiesbaden, 1895. It contains 196 large octavo pages, with extensive critical, historical, pathological, and therapeutic comments, to which the present report is a supplement.

TABLE I.

CLASSIFICATION OF EAR PATIENTS FOR 1893-1896.

External Ear and Surroundings.

Parotitis.....	5	
Affections of inferior maxillary articulation	13	
Glandular swelling in the retro-maxillary fossa.....	2	
Tumor in the retro-maxillary fossa.....	4	
Gumma of mastoid process.....	1	
Gravitation abscess after furuncle of the meatus.....	2	
Syphilitic caries of the parietal bone.....	1	
Emphysema of the temporal region.....	1	
Erysipelas of the auricle and surroundings.....	8	
Congenital fistula of the ear....	1	
Injury of the auricle.....	3	
Freezing of the auricle.....	3	
Abscess of the auricle.....	1	
Othæmatoma	3	
Perichondritis of the auricle....	1	
Arthritic deposits in the helix..	1	
Ulcer of the auricle.....	1	
Herpes zoster of the auricle....	1	
Erectile tumor of the auricle....	1	
Scar on the auricle.....	1	
Eczema of the auricle and of the meatus	68	1.3 % of all ear patients.

Congenital atresia of the meatus and rudimentary auricle.....	1	0.02 %	of all ear patients.
Foreign body in meatus.....	69	1.4 %	" " "
Supposed foreign body in meatus.	4		
Cerumen closing the meatus....	711	13.3 %	" " "
Traumatism of the meatus.....	15		
Fracture of the bony meatus...	2		
Pruritus of the meatus.....	23	0.4 %	" " "
Furuncle of the cartilaginous meatus.....	185	3.5 %	" " "
Otomycosis of meatus.....	24	2.1 %	" " "
Otitis externa crouposa.....	13		
Other forms of otitis externa diffusa	74		
Abscess of the meatus.....	1		
Necrosis of the wall of the meatus.....	2		
Condylomata lata of the meatus	2		
Verruca of the cartilaginous meatus.....	3		
Polyp of the meatus.....	3		
Exostoses and hyperostoses of the meatus.....	54	1.0 %	" " "
Tumor of the wall of the meatus	1		
Cicatricial stenosis of the meatus	3	Sum of the diseases of the tympanic membrane, 1.3 % of all ear patients, of which 0.5 % belong to traumatic rupture.	
Cicatricial atresia of the meatus.	3		
Traumatic rupture of the tympanic membrane.....	24		
Burns of the membrane with hot water.....	2		
Burns of the membrane with caustics.....	1		
Extravasation of blood into the membrane	6		
Hyperæmia of the membrane....	1		
Myringitis chronica.....	9		
Chalky deposits in the membrane, with normal hearing....	7		
Atrophy of the membrane, with normal hearing.....	17		

Total number of the diseases of the external ear.....	1384	} 22.9 % of the 6056 ear diseases, of which 180 (13.0 %) were children (up to 15 years), " 1204 (87.0 %) " adults, " 55.6 % " men, " 44.4 % " women.
"		
"		
"		

Middle Ear.

Injury of the sound-conducting apparatus.....	6	
Simple obstruction of the tube..	221	} 6.8 % of all ear patients.
Obstruction of the tube with accumulation of serum.....	71	
Obstruction of the tube with atrophy of the drum-membrane	62	
Undue patency of the tube....	6	
Otitis media simplex acuta....	459	} 12.2 % " " "
Otitis media simplex subacuta..	189	
Otitis media simplex chronica with retraction of the drum-membrane.....	107	} 10.1 % " " "
Otitis media simplex chronica without retraction of the drum-membrane	258	
Dysacusis of uncertain cause..	172	
Otitis media purulenta acuta...	391	} 8.4 % " " "
Otitis media purulenta acuta with empyema and phlegmon of mastoid process.....	55	
Otitis media purulenta chronica without complications.....	484	} 18.7 % " " "
Otitis media purulenta chronica with hypertrophy and polyps.	210	
Otitis media purulenta phthisica.	44	
Otitis media purulenta chronica with perforation, or hypertrophy in the region of Shrapnell's membrane.....	54	
Proliferation of epidermis in the cavity of the middle ear (cholesteatoma).....	167	
Caries and necrosis of the middle ear.....	37	

Sequelæ of otitis media purulenta with remaining perforation.....	236	} 11.1 % of all ear patients.
Sequelæ of otitis media purulenta with healed perforation.	333	
Sarcoma of the middle ear.....	1	
Otalgia with normal hearing....	242	4.5 % " " "
<hr/>		
Total number of the diseases of the middle ear.....	3825	} 63.2 % of the 6056 ear diseases.
of which 944 (24.7 %) were children (up to 15 years),		
" 2881 (75.3 %) " adults,		
" 55.7 % " men,		
" 44.3 % " women.		

Inner Ear.

Congenital (?) defective hearing with defective speech.....	28	0.5 % of all ear patients.
Deaf-mutes, congenital (?).....	17	0.3 % " " "
Deaf-mutism after injury.....	1	
Deafness and deaf-mutism after meningitis.....	21	} 0.4 % " " "
Hardness of hearing after meningitis.....	2	
Deaf-mutism after convulsions..	3	
Deafness and deaf-mutism after scarlet fever.....	5	0.09 % " " "
Deafness and deaf-mutism after mumps.....	5	0.09 % " " "
Deaf-mutism with congenital syphilis.....	2	
Deaf-mutism with perforation of the tympanic membrane.....	1	
Subjective noises without visible cause and with normal hearing.....	207	3.9 % " " "
Ménière's symptoms with normal hearing.....	7	0.1 % " " "
Acquired nervous hardness of hearing.....	402	7.5 % " " "
Acquired deafness with normal		

appearance of membrana tympani, in part combined with hardness of hearing on the other side.....	135	2.5 % of all ear patients.
Necrosis of the labyrinth.....	3	0.06 % " " "
Central hardness of hearing....	3	0.06 % " " "
Hallucinations (hearing of voices)	2	0.04 % " " "
Hysterical hardness of hearing..	3	0.06 % " " "

Total number of diseases of the inner ear..... 847 } 14 % of the 6056 ear diseases,
of which 87 (10.3 %) were children (up to 15 years),
" 760 (89.7 %) " adults,
" 59.7 % " men,
" 40.3 % " women.

Total number of diagnosticated ear diseases..... 6056
of which 1211 (20.0 %) were children (up to 15 years),
" 4845 (80.0 %) " adults,
" 56.2 % " men,
" 43.8 % " women.

Total number of ear patients... 5327
of which 1031 were children (up to 15 years),
" 4296 " adults.

The following additional cases were recorded :

No diagnosis.....	19
Normal	89
Simulation and aggravation.....	12
Facial paralysis with normal hearing.....	7
Aphasia with normal condition of the ear.....	1
Disease of the nose and naso-pharynx without affection of the ear.....	101

The preference which the scleroses have for attacking the female sex has for years been accentuated by the author and has been looked upon by him as a characteristic peculiarity of this disease, being clearly shown by all of his previous statistics. During these last seven years again, two thirds of all scleroses ($66\frac{2}{3}\%$) affected the female sex.

A similar relation is shown by otalgia, which in 64.0 % of the cases was found in women, in 1890-92 there being 62.2 %,

and in 1893-96 65.0%. *These figures warrant us to class otalgia also among the diseases which with marked preference attack the female sex.*

[Whereas the other remarks of the author on the affections of the outer and the middle ear are clearly enough presented by the statistical report, his remarks on the affections of the inner ear deserve to be translated in full.]

The increase in the "acquired nervous hardness of hearing" in this report is explained by the fact that the author has extended the boundaries for the diagnosis of this condition beyond those in the previous reports.

Whereas formerly, in making the differential diagnosis between nervous hardness of hearing and sclerosis, he relied upon the well-known group of the functional symptoms, viz., shorter duration of bone-conduction, a positive Rinne test, and preservation of the lower boundary of tone-perception through the air, he has been able, in the course of time, to observe a number of otherwise characteristic affections of the inner ear which showed a more or less extensive *defect in the lower boundary of hearing.*

These defects are, however, less frequent than those at the upper end of the tone-scale, nor can they be localized in the inner ear with as much certainty as when perception is missing for a considerable range at the upper end; for it is difficult to determine with certainty whether at the same time the bone-conduction for these lowest tones is lost, on account of the strong concussion of the head which accompanies them. When, however, besides this gap in the hearing of low tones by air-conduction, there is shortening of the bone-conduction for the middle parts of the scale (A to a'), and in addition the Rinne test is clearly positive, the author, after having become more closely acquainted with this form of disease, no longer hesitates to consider it as a pure affection of the inner ear.

The occurrence of such defects was made *a priori* probable by the Helmholtz theory; for there is no reason why an isolated focus of disease should not occasionally develop in the cupola of the cochlea as well as in the beginning of its lowest turn. Experience has proved to the author in no in-

considerable number of cases the correctness of this assumption. Even as late as the years 1890-92, all such cases were classed by him under the indefinite diagnosis "Dysacousis," whereas they were counted in the last period among the cases of "nervous hardness of hearing."

Not only the upper and lower ends but also the *middle portions* of the tone-scale can, as one would expect, be lost to hearing. But when defects exist in these portions the power of hearing speech is at the same time more or less completely lost, and therefore these cases were classed under "deafness."

Among "uni- and bilateral deafness" were classed those cases in which the conversation voice could not be heard with either ear, or when the affection was unilateral, in which the voice whispered into the bad ear, was heard equally poorly when this ear was left open as when it was closed (Dennert-Lucaé test). The actual existence of unilateral deafness was further verified by testing with the unclamped tuning-fork *a'* with air-conduction. As has been shown by the author's studies on "Necrosis of the Labyrinth,"¹ this tuning-fork is heard on the affected side in unilateral deafness, either for a very short time only, even when most strongly sounded, or else it is not perceived at all.

The higher we go in the scale above this *a'*, the less can we localize the tone-perception in the afflicted ear if the other ear is more or less intact. In determining whether there is any hearing at all left for the upper parts of the scale, the only criterion in one-sided deafness is the *length of time* required for the high tuning-forks to die out in *air-conduction* when held next to the ear to be tested. The value of this tone *a'*, which lies in the middle of the tone-scale, for the determination of unilateral deafness, does not consist merely in its enabling us to isolate tone-perception to the ear tested, but also in the fact that it forms the lower boundary of that portion of the range within the once-marked and the twice-marked octaves, the presence of which has shown itself, in the course of the author's investigations

¹ These ARCHIVES, vol. xxvii., No. 2, and *Zeitsch. f. Ohren.*, vol. xxx.

on deaf-mutism,¹ to be indispensable for the understanding of speech.

Deafness to speech, even when slight remnants of hearing exist for one or another series of tones, still forms the most serviceable boundary line between the diagnosis of "nervous hardness of hearing" and "deafness," because in unilateral deafness the only way to exclude the good ear from participating in the hearing of the upper portion of the tone-scale is by the laborious process of testing the duration of hearing.

The number of cases of "deafness with normal appearance of the drum-membrane," limited in the above manner, amounted to 2.5 % during the last period.

The Influence of Age.—Whereas a number of diseases of the inner ear are either congenital or acquired in childhood through infectious diseases, at least in the vast majority of cases the "subjective noises with normal hearing" (2.3 % children, 97.7 % adults), as well as the "acquired nervous hardness of hearing" (2.6 % children, 97.4 % adults), are conditions found almost exclusively in adults.

Subjective noises are, as is well known, rarely mentioned by children, even when manifest changes in the ear exist.

The almost exclusive occurrence of "acquired nervous hardness of hearing," etc., among adults will readily be understood when it is considered what are the causes of its occurrence, namely, detonations, noisy occupations, syphilis, traumatism, and senile degeneration.

"Acquired deafness" is found somewhat more frequently in early life, 7.9 % of the cases being children and 92.1 % adults. This disease, if occurring in childhood, is usually unilateral, and probably is caused, in most cases, by overlooked infectious diseases, especially mumps, injuries to the skull, and even hereditary syphilis; the last form, however, as a rule, is bilateral.

One-Sidedness and Double-Sidedness.—The "subjective noises" were noticed in two thirds of the cases on one side only, and in one third of them on both sides; but it is difficult for many patients to say definitely whether the sounds

¹ *On the Hearing of Deaf-Mutes*, p. 121, Wiesbaden, J. F. Bergmann, and *Zeitsch. f. Ohrenheilk.*, vol. xxx., p. 217.

are confined to one ear, or whether they are heard in both.

The cases of "hardness of hearing, deafness, or deaf-mutism after meningitis" were in 95 % of the patients bilateral, whereas when following "mumps" 77.8 % were unilateral.

"Acquired nervous hardness of hearing not following meningitis and mumps" was in almost four fifths of the cases (79.1 %) bilateral, whereas "sclerosis of the sound-conducting apparatus" could be recognized on both sides in as many as 86 % of these cases.

"Deafness" in the limited sense mentioned above was found on both sides in 87.7 %, and one-sided in only 12.3 %.

It seems natural to assume that the same causes which underlie the diseases which give us the picture of "nervous hardness of hearing," as a rule, also underlie those which lead to deafness for speech, and that "deafness" represents only a more intense form of these same diseases; but the author's statistics show that of the cases of "nervous hardness of hearing" 69.4 % were males, while of the "scleroses of the sound-conducting apparatus" 66.6 % were in female patients. These figures seem to indicate that the above assumption is at least not universally correct, which surmise is strengthened by the following observations.

There is a certain though small number of cases of unilateral deafness for speech in which the author was able by functional examination to establish the presence on the other side of diminished hearing, together with the characteristic symptoms of fixation of the sound-conducting apparatus. He also found gaps *within* the upper portion of the gamut accompanying the otherwise well-marked picture of sclerosis. The upper *end* itself is, as we know, missing in quite a number of these cases. We need not wonder at the simultaneous occurrence of these changes, undoubtedly situated in the inner ear, and sclerosis, when we bear in mind the pathological anatomical changes which, as the author has shown by five post-mortem examinations of temporal bones, are at the base of this affection,¹ and which have also been seen

¹ 1. *Aerztliches Intelligenzblatt*, 1885, No. 24. 2. A case of ankylosis of the

by others, especially Politzer.¹ The ankylosis of the base of the stapes in this disease is accomplished by an otitis of the capsule of the labyrinth in the neighborhood of the pelvis ovalis. When the inflammatory process in the bone is not limited to this region it may reach the wall of the cochlea, as was seen by Scheibe and the author in their specimens and illustrated by them in the *Zeitschr. f. Ohrenh.*, vol. xxiv. (these ARCHIVES, vol. xxiii., p. 48). In consequence of the above-named observations on the living and on the dead, the author has come to the positive conclusion that this process can, even though this be the exception, advance as far as to cause deafness for speech. A case of this kind was observed by the author and reported in detail by Werhovsky.²

The majority of Politzer's autopsies were cases in which deafness had existed during life. However, his patients were inmates of a home for the aged, and the hardness of hearing had existed with all of them for a large number of years.

After what has been said above, the larger number of females in "acquired deafness" than in "nervous hardness of hearing," which can be recognized not only from the above compilation, but also from all of the author's former reports, can be explained by the fact that *deafness for speech may be brought about not merely by changes which are confined exclusively to the nervous apparatus, but also by the final stages of processes which first cause an ankylosis of the base of the stapes.*

In order to explain the relative participation of the two sexes in "deafness," it is not necessary to have many cases of the latter, since, as we have seen, sclerosis, and probably more particularly its gravest forms which lead to deafness for speech, occur much more frequently among women than among men. In connection with the above, it is of interest

stapes. *Zeitsch. f. Ohrenh.*, vol. xxiv., and ARCH. OF OTOTOLOGY, vol. xxiii., No. 1. 3. A further case of ankylosis of the stapes. *Zeitsch. f. Ohrenh.*, vol. xxvi., and ARCH. OF OTOTOLOGY, vol. xxv., No. 1.

¹ On primary disease of the bony labyrinth-capsule. *Zeitschr. f. Ohrenh.*, vol. xxv., and ARCH. OF OTOTOLOGY, vol. xxiii., No. 4.

² Examination of the duration of hearing, etc. *Zeitsch. f. Ohrenh.*, vol. xxviii., and ARCH. OF OTOTOLOGY, vol. xxv., No. 2.

to note that among Politzer's reported autopsies six were performed on women and one on a man.

Clinically, however, we are able only in exceptional cases to follow up the scleroses which we usually observe in middle-aged patients so far as to find that the hardness of hearing actually reaches deafness for speech. In spite of the above exceptions we are, therefore, able, with a clear conscience, to extend to these patients, in addition to our admission of helplessness, the comforting assurance that in all probability at least a portion of their hearing will remain.

Results of Treatment.

As in his former reports, the author summarizes the results of the most important ear diseases, namely, the acute and chronic middle-ear suppurations.

The therapeutic procedures employed by the author are too well known from his "Review" and his former reports to require detailed repetition, and during the past four years he has not felt called upon to deviate from them in any particular.

As has been his habit in former reports, the author again draws these last figures only from his private practice. His reason for this limitation is that the dispensary patients attend too irregularly, and often soon remain away altogether, thus rendering it impossible to follow up regularly the results of our therapeutics, whereas, on the other hand, private patients are much more reliable in this respect.

The frequency as well as the nature of the operative interference required in the various diseases can best be recognized from the summary of the operations during the last four years, which is given at the end.

I. Among 332 cases of *acute* suppuration of the middle ear in private practice

There were healed with closure of the drumhead perforation	243 or 73.2 %
There were improved with cessation of secretion but persistence of perforation.....	8 " 2.4 %
The secretion continued in spite of prolonged	

treatment in.....	4 or 1.2 %
There were seen only once, or a few times.....	74 " 22.3 %
There died.....	3 " 0.9 %

II. Among 870 cases of *chronic* suppuration of the middle ear

There were healed with closure of the drumhead perforation.....	22 or 2.5 %
There were improved with cessation of secretion but persistence of perforation.....	455 " 52.3 %
The secretion continued in spite of prolonged treatment in.....	124 " 14.2 %
There were seen only once, or a few times.....	267 " 30.7 %
There died.....	2 " 0.2 %

In addition to the above 5 deaths in private practice, there must be added from the patients of the hospitals and dispensaries for the years 1890-96, 6 deaths in 465 acute middle-ear suppurations and 9 deaths in 923 chronic middle-ear suppurations.

The complications emanating from the middle ear in these 20 fatal cases were :

Facial paralysis.....	in 4 cases
Deafness.....	" 9 "
Subperiosteal abscess in the external neighborhood of the ear.....	" 5 "
Extradural abscess and pachymeningitis externa....	" 11 "
Fresh or old sinus-thrombosis and phlebitis.....	" 9 "
Metastatic foci in the lungs, spleen, and kidney, <i>with</i> <i>out</i> sinus-phlebitis.....	" 2 "
Leptomeningitis (twice circumscribed).....	" 7 "
Single or multiple brain-abscesses.....	" 8 "
of which 4 cases were abscesses in the temporal lobe (2 single and 2 double), 2 abscesses of the cerebellum, 1 an abscess of the occipital lobe, and 1 multiple abscess of the cerebrum and cerebellum (besides scarlet fever).	

In 5 cases it is doubtful whether the ear disease was really the cause of death, inasmuch as it was accompanied twice by severe scarlet fever, once by acute miliary tuberculosis, and once by severe influenza-bronchitis, and in one case the

death of the patient was only reported half a year after his departure from the hospital.

In the remaining 15 cases the autopsy proved conclusively that death was directly dependent upon the affection of the ear.

The author hopes to be able to publish the autopsies in a later paper.

During the period 1890-96 inclusive, the middle-ear spaces were opened in 160 cases, the cranial cavity being opened in some at the same time.

It must be stated, however, that not a small number of these cases was sent from out of town in a condition which necessitated immediate operation. Among an equally great number of patients coming from a certain territory alone the number of operations would naturally be much smaller.

Of these 160 cases of opening of the middle-ear spaces, 12, or 7.5 %, died. The majority of the fatal cases came under observation at so late a stage that the prognosis was from the first rather hopeless.

The *mortality in private practice* for the 332 cases of acute suppuration of the middle ear, observed during the years 1890-96, was 3, or 0.9 %, and for the 870 cases of chronic suppuration 2, or 0.2 %.

The *mortality* among the ear patients in the *dispensary* and *hospitals* was somewhat higher.

During the same period there were among 465 cases of acute middle-ear suppuration 6, or 1.3 %, deaths, and among 923 chronic suppurations, 9, or 1.0 %, deaths.

In the *total number* of the 797 *acute diseases* observed during 1890-96, there were, accordingly, 9, or 1.1 %, deaths; in the 1793 *chronic suppurations* 11, or 0.6 %, deaths; and, finally, in the 2590 *acute and chronic suppurations* of the middle ear *together* there were 20, or 0.8 %, deaths.

The author concludes the report with a *review of the operations performed on the 5327 ear patients treated during the 4 years, 1893-96.*

Paracentesis of the drumhead.....	186
Viz.: for acute purulent otitis media with empyema	
of the mastoid.....	100

for purulent otitis media chronica.....	1	
for simple acute and subacute otitis media.....	58	
for affections of the Eustachian tubes.....	27	
Removal of granulations and polypi with snare, spoon, etc.....		226
Viz.: for acute purulent otitis media with empyema of the mastoid.....	21	
for chronic purulent otitis media.....	122	
for perforation of Shrapnell's membrane.....	18	
for cholesteatoma	53	
for caries and necrosis.....	9	
for polyps of the external meatus with normal middle ear.....	3	
Extraction of the hammer.....		16
Viz.: for chronic purulent otitis media.....	7	
for cholesteatoma.....	7	
for caries and necrosis.....	2	
Extraction of the hammer and anvil.....		4
Viz.: for chronic purulent otitis media.....	1	
for caries and necrosis.....	3	
Extraction of the stapes for chronic purulent otitis media		1
Wilde's incision for acute purulent otitis media with empyema of the mastoid.....		1
Opening of the mastoid after Schwartze.....		63
Viz.: for acute purulent otitis media with empyema of the mastoid.....	56	
for chronic purulent otitis media.....	2	
for caries and necrosis.....	5	
Opening of the mastoid and removal of the posterior wall of the meatus, after Zaufal.....		33
Viz.: for chronic purulent otitis media.....	1	
for perforation of Shrapnell's membrane.....	2	
for cholesteatoma.	20	
for caries and necrosis.....	10	
Removal of adenoid vegetations from the naso- pharynx.....		118
Viz.: for acute purulent otitis media with empyema of the mastoid.....	6	
for chronic purulent otitis media.....	3	
for cholesteatoma	1	

for simple acute and subacute otitis media.....	8	
for affections of the Eustachian tube.....	83	
for causes not connected with the ear.....	17	
Tonsillotomy.....		15
Viz.: for acute purulent otitis media with empyema of the mastoid.....	1	
for simple acute and subacute otitis media.....	2	
for affections of the Eustachian tube.....	7	
for causes not connected with the ear.....	5	
Removal of nasal polypi and hypertrophies for causes not connected with the ear.....		10
Total number of operations.....		673

ON THE FUNCTIONAL EXAMINATION OF THE
EAR. WITH AN EXHIBITION OF BEZOLD'S
CONTINUOUS TONE SERIES.¹

BY HERMAN KNAPP, M.D., NEW YORK.

THE subject of my communication has been prompted by Bezold's recent paper on the "Determination of One-Sided Deafness, with Six New Cases of Necrosis of the Labyrinth," published in the ARCHIVES OF OTOTOLOGY, vol. xxvii., 1898, p. 158, which contains an irrefutable proof of the still disputed fact that an ear without a cochlea cannot hear. Bezold's demonstration, a triumph of long-continued painstaking labor, impressed me so forcibly that I think the examination of the whole range of audition will for the organ of hearing prove as important as is the examination of the field of vision for the organ of sight.

To consider the subject in connection, I would beg leave to touch briefly on well-known topics. A complete functional examination of the ear has to determine the three qualities of sound: intensity, pitch, and clang-tint.

The **examination of the intensity of sound** determines the *sharpness of hearing*, for which we use (1) the *watch* and different kinds of acoumeters, and (2) *the human voice*.

The watch and other instruments with ill-defined sounds were formerly thought to be particularly appropriate for determining the hearing power of noises. During the last years, since by the investigations of Barth and others it has been ascertained, acceptably to almost all otologists, that a noise is composed exclusively of musical sounds, though not

¹ Read in abstract at the meeting of the American Otological Society, held at New London, July 19, 1898.

so easily analyzable as those of tones, the acoumeters have lost credit in favor of the human voice ; yet they are serviceable and, on account of their convenience, likely to continue being generally used.

In determining the *acuteness of hearing*, we want to find the minimum intensity of sound a given ear is capable of perceiving. In testing with instruments of an invariable loudness, the acuteness of hearing is proportional to the square of the greatest distance at which an ear can perceive their sounds. In this country we have long been accustomed to express this value by a fraction, the numerator of which denotes the distance at which the examined ear hears the test instrument, and the denominator the distance at which a normal ear would hear it. Other modes of notation may be desirable for particular cases, for instance the graphic (percentage) method of Hartmann, but I have heard of none that is so convenient and at the same time so accurate as ours which expresses the patient's hearing power in a fraction of the normal, just as all the world expresses the acuteness of vision. Our notation of the acuteness of hearing would also be universally adopted if there were so easy and uniform a means of testing hearing as are Snellen's test types. But if, in otology, we cannot have the best test, we must take the best we can, and that is, by common consent, the *human voice*. I need not go into details, but a few remarks I beg to make.

Is it better to use whispering or louder voice? I think we have to use both ; loud voice if the patient is so hard of hearing as to understand no whisper. As regards the normal hearing distance of whispering or ordinary voice, this is a subject which every examiner has to determine for himself individually, as it depends on the strength of his own voice and the conditions of his surroundings. This is a personal matter, and when an aurist has once determined it, he will make all his entries on the same basis ; they will be comparable with one another, and give just as reliable an account of the accuracy of his examination as the reports of his own cases are in other respects. We must, from time to time, verify our former standard. Just as a watch in the course

of years has a weaker tick, by smoothening of its gear, so a man's voice is apt to get weaker with advancing years.

As regards test words, I am accustomed to take them from the most diversified objects, so as to give patients no clew by guessing. Some, for instance Bezold, use numerals exclusively. The patient expects them and makes bold guesses which sometimes are correct. If I say "Washington," and the patient, in repeating, says "forty-one," I know in which way my predecessor had examined him. We must make allowances also for foreigners, and for the peculiarities and imperfections in our own enunciation.

Of great value is the **tuning-fork test**. It is used, however, not so much to determine the acuteness of hearing, as the *range of audition*, the *pitch of sound which the human ear is capable of perceiving*, not its intensity.

As a subject of transition between the examination of intensity and pitch of sound, let us consider how we can detect *one-sided deafness*. This is not so easy as to detect one-sided blindness. The sound waves passing through air, liquids, and solids, and not only in straight but also in crooked lines, it is impossible to prevent them from reaching the other ear. For practical purposes I have, for years, been able to recognize one-sided deafness with sufficient accuracy by using the following tests:

1. *Dennert's test*. The patient closes the good, or, let us say, the better ear, by pressing the end of his moistened index finger snug into the ear canal. The other ear is tested with an acoumeter and the voice. Then the patient is told to stop also the bad ear up, and keep both closed. If the acoumeter and the voice are heard at the same or almost at the same distance, the inference is, that the bad ear does not add anything to the hearing power of the patient.

2. *Weber's test (D. V.)*. A tuning-fork, C, c, c' or c'', is sounded on the vertex of the patient, who is then asked on which side he hears it. If he says on the side of the good ear, we stop up this ear, and if the patient then says he does not hear it at all, he is either a malingerer or he tries to correct his impression by his mind, supposing that he could not hear when the good ear is closed and the other deaf. He may

act in good faith or not. We have to repeat the experiment with some cross-questioning. If he finds out that closing of the good ear lets him hear the fork louder, but closing of the deaf ear makes no difference at all, he is deaf in one ear, but honest. If, on the contrary, he persists that closing the good ear makes him deaf, or at least hard of hearing, in the good ear too, we may, according to Moos, put him down as a malingerer.

3. A test which the present writer described in 1873 and has used ever since, in combination with the preceding ones, is the following: If we move a tuning-fork of medium pitch, say *c'*, up and down before the good ear, the patient hears it sound with puff-like enforcements when it passes before the meatus of the good ear; moving it then up and down before the other, deaf, ear, he will hear it evenly or almost evenly; an intelligent person may hear also slight puffs when the fork passes before the meatus of the deaf ear. The reason of this is that the sound waves, reaching the good ear through the head, strike it more directly and with greater force when passing through the canal of the deaf ear than through the skull. This can be proven if we let the patient stop the meatus of the bad ear. He then hears the fork no longer in puffs, but evenly.

To detect real and simulated one-sided deafness, a forked elastic tube has been used by Coggin,¹ E. Bloch,² and others. The free ends of the tube are placed from behind into the patient's ears; the other ends are connected with a curved glass-tube, on which a tuning-fork is placed. If one ear is deaf, the sound of the fork can be heard only in the other. If the tube leading to the latter is noiselessly stopped, no sound at all is heard; but when the other tube is stopped, the sound, going wholly into the good ear, is heard enforced.

The determination of one-sided deafness has its importance not only by establishing the fact, for instance, after mumps, to give the patient a competent opinion as to the

¹ Coggin, these ARCHIVES, VIII., 177.

² E. Bloch: "Die Ermittlung einseitiger completer Taubheit." *Zeitsch. f. Ohrenhke.*, xxvii., p. 267, 1896.

uselessness of therapeutic trials, but also to guide our steps when radical operations are indicated. To illustrate this by an example :

At the end of June, 1898, a young man was brought to me by his physician. His right ear had suffered from purulent otitis since childhood, and had been operated on three times, the last time, two months previously, by an extensive mastoid opening. There was a large granulating wound in the mastoid, which reached high up. The tymp. memb. was gone, and granulations and bare bone could be felt at the bottom of the middle ear. The probe could be introduced under the lateral wall of the attic, up and considerably backward. Temperature 100°, headache, dizziness, etc.

The left ear was healthy, and hearing almost normal. The right ear was totally deaf, according to the above three tests, of which the last came out very definitely. I made the diagnosis of caries of mastoid, tympanum, and attic, extending into the labyrinth. There was no facial paralysis. I stated that a radical operation should be performed, to remove all dead and diseased tissue, including the labyrinth wall of the tympanum, the lateral wall of the attic, and all whatever was diseased in the mastoid. I told the physician that the utmost precaution should be exercised, in the endeavor to be thorough, not to injure the facial nerve. The operation was difficult, and lasted two hours. The dura at the bottom of the middle cranial fossa, evidently laid bare by the previous operation, was thickened by an inflammatory grayish-white coat, imposing for cholesteatoma. The posterior wall of the mastoid was carious, but I left it alone until toward the end of the operation, for fear of accidentally injuring the lateral sinus. The tympanum was cleansed, the posterior wall of the meatus chiselled away over a probe introduced from the attic into the antrum. The antrum was small, surrounded by sclerosed bone. The lateral wall of the attic, being freely exposed, was chiselled off in its whole extent, the corroded head of the hammer and the body of the more corroded anvil were picked up, the vestibule was entered, and the whole bony part of the operative cavity carefully curetted, its walls were smoothened, then the posterior wall of the mastoid, brittle and pervaded with granulations, was removed with a sharp spoon. In doing so, the healthy-looking sigmoid sinus was exposed. After stopping the

hemorrhage, the posterior soft wall of the meatus was split longitudinally, then vertically, at its anterior end, the upper flap stitched into the upper corner of the wound, and together with the lower flap pressed against the posterior bony wall of the wound by aseptic gauze passed through the meatus out of the wound in the mastoid. There was no facial paralysis.

The patient, thus far, has made favorable recovery.

Tuning-forks have long been used as an aid to the *differential diagnosis between diseases of the conductive and nervous parts of the auditory apparatus*. Being able to examine physically, *i. e.*, otoscopically, only a part of the conductive apparatus and nothing at all of the nervous portion, the correct diagnosis of ear disease is infinitely more difficult than that of the diseases of the visual organ. The functional examination, disappointing so long on account of the combination of affections of the conductive and the nervous apparatus, has only of late acquired greater precision, even a considerable degree of certainty, by the labors of Bezold, Politzer, and others. The anatomical investigations of cases that had been examined functionally have shed a great deal of light on this difficult subject.

The **range of audition** of the human ear, according to Bezold and Edelmann's determination, extends from the subcontra C (C^{-11}) with 16 double vibrations up to a^8 with nearly 55,000 v. d., comprising almost 12 octaves. Just as in the visual field of the organ of sight, defects in any part of this extensive range have been found to exist and have a good deal of significance. They are met with chiefly at the two ends of the scale, those at the lower end, the deep tones, pointing to disease of the conductive apparatus, and those at the higher end, to disease of the nerve.

It has been a difficult thing to obtain an instrument of examination capable of testing all the tones that the healthy human ear is capable of hearing. Bezold, after years of persistent labor, and aided by his able colleague, the celebrated constructor of physical instruments and apparatus at the University of Munich, Prof. W. Edelmann, has succeeded in devising and having made in most accurate manner a **continuous tone series**, of which I have the pleasure

of placing before you a copy of the newest model. It is a large and cumbersome apparatus, requiring two large boxes to contain the necessary parts.

The series from the lowest 15 v. d. (formerly 16 v. d.), C—II, to c³ (1024 v.), is furnished by a series of 10 clamped tuning-forks. Each of them contains about a quint. The intervals are marked with half-tones and the numbers of vibration. The single tones are distinguished by a remarkable uniformity of intensity in the whole series.

The upper part of the tone series from c³ to the upper tone-limit is contained in two covered organ pipes, and the new modification of Galton's whistle by Professor Edelmänn.

The three instruments are provided with devices to change the width of their mouthpiece, to "intone" them, so as to let all the tones contained in them come out with the same clearness. By this new device it is possible to adjust, by means of a micrometer screw, the mouthpiece of the Galton whistle so accurately as to pull the upper tone-limit of the normal ear in all copies at the same place of the millimetre scale. The upper tone-limit comes out much more distinctly than with the former copies and can now, without difficulty, be perceived by the patient, and at so large a distance that the simultaneous blowing sound becomes inaudible.

The progress of the availability of tuning-forks as an aid in diagnosis has been so very slow that their value in general continues to be questioned even at the present day. The greatest skeptic in this line, Dr. L. Jacobson, for many years chief of Professor Lucae's otological clinic at the University of Berlin, sums up in the second edition of his excellent text-book of otology, 1898, p. 86, his discussion on the diagnostic use of tuning-forks as follows: "*For all these reasons the results of these methods can, in my opinion, under no condition furnish sure points of information [sichere Anhaltspunkte] concerning the differential diagnosis of the seat of disease in the sound-conducting or the sound-perceiving apparatus*" (italics his). The methods he discusses are well known, namely:

1. *The duration of perception of the tuning-fork by bone-conduction* (Schwabach's test). He says the moment a tuning-fork stops being perceived is not easily determined,

requiring the verifying examination of a normal ear of a person of the same age as the patient. Apart from this difficulty we have to take into account that the duration of sound-perception by bone-conduction, according to Siebenmann, seems to vary not inconsiderably in persons of the same age, probably owing to differences in the pneumatic cavities of the temporal bone.

2. *Weber's test.* If only one ear is affected and the tuning-fork is constantly lateralized to that ear, we have to deal with disease in the sound-conducting apparatus on that side. If both ears are affected, the results are less decisive, but even then the test will be a valuable complement to other methods of examination. Jacobson, however, dwells on the uncertainty of the patient's powers of observation, and the changes of the result with the changes of application of the fork (Urbantschitsch) and also with the pitch of the fork. He cites Schwartz¹ as drawing conclusions from Weber's test only if at different times, before and after air-douche, with forks of different pitch, and applied to different places of the skull, the result is invariably the same. Jacobson accepts also the statement of Lucae²: "If in the course of a middle-ear suppuration the lateralization of the sound disappears from the diseased ear, extension of the suppuration to the labyrinth may be assumed, which renders the prognosis exceedingly unfavorable not only as to hearing but as to life."

3. *Rinne's test* receives from Jacobson the following endorsement: "Its negative result, according to Bezold,³ proves the presence of an alteration in the conducting apparatus in all affections of both ears, if the hearing power of the one does not differ too greatly from that of the other."

We see that Jacobson himself makes extensive concessions as to the utility of the tuning-fork test in the diagnosis of the seat of ear diseases.

Let us now consider these tests in regard to the **range of audition**, the pitch of sound. There is no instrument (piano,

¹ Schwartz, *Die chirurgischen Krankheiten des Ohres*, Stuttgart, 1885.

² Lucae, *Die Schallleitung durch die Kopfknochen*, Würzburg, 1870, p. 48.

³ Bezold, *Zeitsch. f. Ohr.*, "Statistische Ergebnisse über die diagnostische Verwendbarkeit des Rinne'schen Versuchs," xvii., p. 153, 1887.

König's steel rods, and others) so convenient and reliable as the tuning-fork, supplemented by organ pipes or a Galton whistle. The continuous tone series lets us recognize any tone defect, small or large, and in this wise aids materially in the location and significance of ear disease.

First of all we determine the *lower and upper tone-limits*, in regard to which it is now generally believed, in the light of a goodly number of post-mortem examinations, that defects at the lower end of the scale indicate disease of the conducting apparatus, and defects in the upper, disease in the perceptive apparatus. The conducting apparatus includes the windows, especially the oval which, as has been known for many years, may be affected with degenerative diseases, fibrous and bony anchkylosis, interfering with the vibratility of the foot-plate of the stapes. The nervous diseases of the ear, in spite of excellent work done by Moos, Steinbrügge, and others, are not sufficiently known to admit of a classification based on pathology.

Bezold has made very remarkable discoveries of the preservation of single and connected tones, and series or groups of tones, in the hearing organs of deaf-mutes, resembling the islets in the field of vision of certain blind people, in particular such having suffered from retrobulbar neuritis. He ascribed them at first to preserved parts of Corti's organ, but afterward found it probable that they did not result from destruction in the labyrinth, but rather from central disturbances, probably in the auditory centre situated in the temporal lobe. They seemed to be examples of genuine word-deafness. He found that the preservation of an acoustic range from b^1 - g^2 was the best field for the cultivation of speech in deaf-mutes. The Bavarian Government, in building a new and magnificent Deaf-Mute Institute, has ordered that every pupil soon after his admission shall be examined by a competent aurist as to his capabilities of learning spoken language.¹

A very brilliant use of his continuous tone series has been

¹ Bezold, "Nachprüfung der im Jahre 1893 untersuchten Taubstummen." Zweiter Nachtrag zum *Hörvermögen der Taubstummen*. J. F. Bergmann, Wiesbaden, 1896.

made by Bezold, in the examination of labyrinthless ears, of which he describes six new cases.¹ In every one the hearing power left was reflected (a faint photograph) from the other ear, which proved conclusively that the labyrinthless ear has no hearing power in itself, just as the moon has none but borrowed light. The cases in which the hearing in the labyrinthless ear is stronger, when only the good ear is closed, than when both are closed, is explained by the fact that the air in the meatus and in the cavity of the middle ear formed by the exfoliation of the labyrinth acts as a resonator in enforcing the sound.

In conclusion, I want to say that *a thorough functional examination of the ear (or of the eye) consumes so much time* that we can do it only as a laboratory study to educate ourselves, and in particularly important cases of disease.

In the ordinary routine practice it should never be entirely omitted, but restricted to the requirements of the case. In all cases we should test the acuteness of hearing with the watch or an acoumeter as well as with the voice in whispering or louder speech, and record the results as fractions of the normal standard.

Whenever impairment of hearing is present or imminent, the tuning-fork tests, both for air- and bone-conduction, are indispensable. Rinne's test with a fork of middle pitch, from c to a^1 , is sufficient in simple cases; in complicated, especially chronic cases, be they catarrhal, adhesive, or suppurative, Rinne's test is to be supplemented by Schwabach's (measuring the duration of sound) and Weber's tests.

In advanced cases we should examine the range of audition as to pitch, especially both ends of the scale, with three forks: a lower $C-A$, a middle c^1-a^1 , and a high one c^4 .

For one-sided deafness, Dennert's, Weber's, and the present speaker's tests are sufficient, whereas in the gravest cases with tone defects in one or both ears, for instance in deaf-mutes, Bezold's continuous tone series alone will make a thorough examination possible.

¹ Bezold, "The Determination of One-Sided Deafness. Six Additional Cases of Necrosis of the Labyrinth." Supplement to article on "Labyrinth Necrosis and Paralysis of the Facial Nerve." ARCH. OF OTOL., xvi., p. 297; ARCH. OF OTOL., 1898, p. 158.

HEMORRHAGE FOLLOWING TONSILLOTOMY.

By C. ZIMMERMANN, M.D., MILWAUKEE, WISCONSIN.¹

A man, aged nineteen years, came to me on account of an acute exacerbation of a chronic purulent otitis media of his left ear, which, after about a month's treatment, healed with closure of the perforation and normal hearing. Soon he had a relapse with profuse mucous secretion. I, therefore, advised him, as I had done when he first came, to have his hypertrophied tonsils removed, as they produced by the cheesy accumulations in their crypts a constant irritation of his throat and predisposition to the recurrence of the ear affection. I cut the tonsils in local cocaine-anæsthesia with Blandin's knife. When the bleeding seemed to have ceased he rested a little. After a while I noticed that the left tonsil was again bleeding. Gargling with ice water being of no avail, I cauterized the cut surface with the galvano-cautery, which proved also insufficient. Then I made compression with a piece of cotton soaked in perchloride of iron. About an hour and a half had elapsed with these procedures when the hemorrhage seemed controlled. At twelve noon he left my office with the advice to send for me, or to return immediately if the bleeding should return. At 5 P.M., he came again, looked very pale, and stated that he had vomited large quantities of blood. On re-examination I found a large blood clot covering the tonsil which irritated the pharynx and made the patient vomit considerable blood repeatedly. From the lowest part of the tonsil arterial blood trickled down his throat. I then compressed this place with styptic cotton, but in vain. His pulse was rather low, and he felt weak and looked very anæmic. In order to get a better view, I removed the whole clot, and found a bleeding spot, apparently

¹ Read, by invitation, before the Fox River Valley Medical Society at Marinette, Wisconsin, April 12, 1898.

an artery, in the centre of the cut surface. Cauterization with a thick red-hot iron probe not being sufficient, the bleeding place was grasped with an artery forceps, under the kind assistance of Dr. G. D. Ladd, which controlled the hemorrhage. After the forceps were left in place for a while, the vessel was twisted and the bleeding did not recur. The patient, who was very anæmic from the loss of blood, stayed in bed for several days and made a good recovery. The discharge from his ear ceased entirely on the day after the operation.

This was my first experience of the kind, although I have removed a large number of tonsils with Blandin's knife as well as with Mackenzie's and Mathieu's tonsillotomes.

If we consult literature we also find that hemorrhage after tonsillotomy is of very rare occurrence. De Santi published a very good paper on this subject in the *Lancet*, 1894, I., p. 83, in which he gives a review of the incident literature. Capart saw but one severe hemorrhage in more than two thousand tonsillotomies. In Sajous's *Annual* of 1891, vol. iv., only nine cases of hemorrhage are recorded from a collection of twenty thousand cases. Wright has published a table of cases of hemorrhage after tonsillotomy from the records of the previous twenty-five years in the library of the Surgeon-General at Washington, which amounted to thirty-one cases. In more than one-third of them, *ice, direct pressure to the bleeding surface, or torsion of the spurting vessel was sufficient to check the hemorrhage*; in two cases the *common carotid was tied*; in three the patient was hæmophilic; in two vomiting set in and stopped the hemorrhage; and in another case, when styptics, direct pressure, and Paquelin's cautery had been used without success, the stump of the tonsil was tied *en masse* and the bleeding ceased. Many of these cases were very severe and *two out of thirty-one had a fatal issue*; in one of them, a child aged eight years, there was an abnormally distributed internal carotid artery. Semon saw his first case of hemorrhage, after several hundred tonsillotomies, in a man, aged forty-six, with chronically enlarged tonsils; the bleeding was stopped by direct digital compression. He had used Mackenzie's tonsillotome, as well as in another case, in a female, aged twenty-three, in which an uncontrollable

hemorrhage followed from the whole surface of the tonsil. Tannic acid and gallic acid, ice, direct digital pressure, all failed, and the bleeding eventually ceased spontaneously in about two and a half hours, when the patient was put to bed and kept at rest. Billroth attributed the bleeding in his case to a wound of the faucial pillars by his bistoury. Downie checked a hemorrhage after tonsillotomy, performed with Mackenzie's tonsillotome, by applying the actual cautery to the bleeding point. De Santi observed three cases, one in a girl of fifteen, another in a child of eight years, all operated upon with Mackenzie's tonsillotome. In the one, a large slough in the situation of the right tonsil was seen, and in the centre of it arterial hemorrhage noted, which was controlled by Paquelin's cautery; in the other case, it was arrested by ice in the mouth. Morrell Mackenzie mentions in his book on diseases of the throat that he had only once met with a case in which the bleeding appeared actually to endanger life, and Hunter Mackenzie never saw it in 230 cases.

**How can the Occurrence of Hemorrhage after Tonsillotomy
be Avoided?**

Tonsillotomy should never be performed in certain constitutional affections, as in hæmophilic or such persons who, from various reasons, have a tendency to bleed profusely, or where there is hypertrophy of the left ventricle.

Age seems to be of some importance, as hemorrhage after tonsillotomy occurs more frequently in adults, but it has also been observed in children. Wright, *Boston Medical and Surgical Journal*, 1892, May 12th, advises to exclude the cutting operation in all patients past eighteen years of age, as it is impossible to tell, by feeling or inspection, in an adult case, what the vascular condition of a tonsil is at the plane through which the incision is to pass.

According to de Santi, the bleeding is usually traceable to some abnormality in the distribution of the blood-vessels: of the ascending pharyngeal artery, to abnormally large tonsillar artery, abnormally internal carotid, large vessel in the anterior faucial pillar, large venous plexus at the lower

and outer border of the tonsil. The tonsillar artery is a branch of the ascending pharyngeal and ascending palatine.

Zuckerkindl attributes the cause of hemorrhage after tonsillotomy to the relation of the tonsillar artery to the capsule of the tonsil. If the artery is cut in the plane of the capsule with which it is closely connected, winding around it before penetrating it, the artery cannot retract or contract, so that the formation of a thrombus and closure of the vessel is prevented.

Sometimes large vessels are seen on the surface of the tonsil, which itself may consist of erectile tissue, as Schech observed in a child, in which the tonsils almost disappeared after application of cocaine.

If there is atheroma of the blood-vessels in older persons, the vessels do not contract after being cut.

The same may occur in very solid tonsils of a fibrous structure, which may be felt with a probe. In these the walls of the blood-vessels are adherent to the surrounding unyielding tissue, and cannot collapse. But a soft surface is not always a criterion of the condition of the deeper tissue, which may be fibrous.

Tonsillotomy should never be performed in the state of acute inflammation, as there is hyperæmia, and the blood-vessels are injected and more apt to bleed.

In our case cocaine has been used, but it cannot be accused for the bleeding by the following relaxation of the blood-vessels, as its action is limited to the surface, and does not extend to the deeper vessels. Cholewa (*Monatsschrift f. Ohrenheilk.*, 1897), however, warns against its use in the operation of adenoid vegetations, as he thinks it may give rise to secondary hemorrhage.

Some claim that bleeding is more apt to occur after the use of the bistoury than of the tonsillotome. This, however, is not corroborated by literature, which shows that in most cases of hemorrhages reported the operation was done with the tonsillotome. I have removed many tonsils with the knife, which in some cases is the only instrument to be used,—for instance, in very large tonsils, which cannot be encircled by the ring of the guillotine,—and I never saw bleed-

ing of any amount except in this particular case. Of course, the anterior faucial pillar must not be cut, and the knife must not stray so far as to imperil the carotid. To be sure, the latter is safe when the tonsillotome is used. In either case the tonsil should not be pulled out too much between the faucial pillars, and *no pressure from outside should be exerted towards the instrument.*

Moritz Schmidt, Schech, Huguenin, Magnan, and others, *use now exclusively the galvano-cautery snare*, to avoid hemorrhage, but this does not insure absolute security from bleeding, there being records of several cases of severe hemorrhage resulting from its employment.

After the operation the patient should keep quiet, not travel, not use his voice, avoid alcoholics, and not eat solid food for several days.

Cases of secondary hemorrhages have been recorded in which a severe hemorrhage occurred, *e. g.*, after eating bread on the fourth day. Gargling with cold water after the operation is to be recommended, but must not be continued too long, as it may interfere mechanically with the formation of thrombi. Then it is better to keep a piece of ice in the mouth.

After the bleeding ceases, I generally dust the cut surface with iodoform mixed with tannic acid. Should the bleeding persist, Mackenzie recommends to powder the wound with a gallic and tannic acid mixture, 1 : 3, or to let the patient sip it in a watery solution. Hovell makes a stiff paste of it and rubs it with his finger into the bleeding surface. If the hemorrhage is parenchymatous from the whole surface, some recommend the application of perchloride of iron by a piece of cotton soaked in it. It forms, however, thick blood-clots, which, when the bleeding does not stop, greatly interfere with a good view of the parts, as in our case, in which the bleeding spot was hidden by the clot.

Compression, digital or with a pair of long forceps, the blades being covered with cotton or gauze, one applied to the cut surface, the other on the outside close to the angle of the jaw, and then tied together, will not be tolerated very well by the patient, although it has been reported to be suc-

cessful. The best method in persistent hemorrhage is to make a very careful examination of the cut surface, to see whether a single point is bleeding. This may be cauterized with Paquelin's thermo-cautery, or a thick probe made red-hot. The galvano-cautery at once becomes inefficient, being cooled by the amount of blood.

If cauterization is not successful, the bleeding spot is best grasped with an artery forceps, which is left in place for a while, and then torsion is made.

Butler suggested ligature *en masse*, which, however, would hardly be possible, as there is no stump to put it around, so that slipping of the ligature can scarcely be avoided. Dawbarn (*Med. Record*, December 17, 1892, p. 699) devised a purse-string ligature around the bleeding surface made with four stitches by a large semicircular needle and needle-holder. In desperate cases, ligature of the external, not common, carotid remains as the ultimate refuge.

In all cases of severe bleeding after tonsillotomy the patient ought to be kept in an erect position, so that by the resulting anæmia of the brain he is apt to faint, as a spontaneous restraint of the bleeding has been observed in cases in which an attack of syncope occurred. As mentioned before, severe hemorrhage after tonsillotomy is rare, but if a surgeon once has had such an experience, he cannot lay too much stress on the advice, before every tonsillotomy, to be thoroughly prepared to meet such an emergency effectually.

SINUS DISEASE OF OTITIC AND RHINITIC ORIGIN AND GENERAL INFECTION; CENTRAL DEAFNESS IN SUPPURATIVE AFFECTIONS OF THE CRANIAL CAVITY.¹

BY DR. H. PREYSING (ASSISTANT).

Translated by Dr. ARNOLD H. KNAPP, New York.

FROM November 1, 1896, to November 1, 1897, the following nine cases of otitic and rhinitic sinus disease were observed at the Rostock Ear and Throat Clinic:

CASE I.—Suppurative Ethmoiditis after Scarlet Fever—Orbital Abscess—Phlebitis of Cavernous Sinus and Septico-pyæmia—Evacuation of the Orbital Abscess and the Ethmoid Cells—Death.

B. D., five years old, was taken ill with scarlet fever on January 26, 1897. Four days later a purulent discharge from the nose set in, and the temperature rose to 40°. On February 5, 1897, the left eye became sensitive to light and the lids œdematous. On February 9th, both mastoid processes became tender. On the following day both ears discharged, and patient was admitted to the ear clinic.

The child appeared emaciated, the lids of the left eye were œdematous. Both auditory canals filled with pus; a light reflex could be observed in the depth of each. The mastoids were not swollen nor tender. There was a hard, painful group of glands below the right mastoid process extending to the inferior maxilla. The nose contained thick muco-pus. Otherwise the child seemed healthy. In the following days the œdema of the lids increased, and the left eye protruded. The glandular swelling grew larger, and on February 15th fluctuation was apparent.

¹ From the Ear and Throat Clinic in Rostock.

The mass was incised, and pus, glandular débris, and granulations were evacuated.

The temperature had gradually returned to the normal, but on March 2d it suddenly shot up, with diarrhoea and abdominal distension, rapid pulse and respiration. The left eyeball was forced down and out, but no swelling appeared at the orbital margin except the œdema.

The protrusion of the eye increased; the fever continued high with deep remissions. As there was no evidence of pus retention in the ears, the cause for the pyæmia had to be looked for in the ethmoidal suppuration and orbital abscess. On March 6th an incision was made along the supraorbital margin to the root of the nose, the orbital contents were pushed aside, and a subperiosteal abscess evacuated; the os planum was carious, and the diseased ethmoidal cells were curetted. The frontal sinus was opened and found empty.

Though the symptoms were alleviated, the patient grew weaker, and died on March 9th. The sensorium remained perfectly free to the last. An autopsy was not permitted.

This case differs from the nine cases of fatal ethmoid disease described by Dreyfuss in his "Disease of the Brain and its Adnexa after Nasal Suppuration," as in all of that author's cases, meningitis was the eventual cause of death. In our case every sign of meningitis was wanting. From the clinical symptoms, the pyæmia evidently started from the ethmoid suppuration, complicated with an orbital abscess, in a child already weakened from scarlet fever. Systemic infection from an orbital abscess through the cavernous sinus is readily explicable from the anatomical relations.

CASE 2.—Pyæmic Fever in Acute Otitis Media—Recovery after Evacuation of the Tympanic Abscess.

M. M., fifteen months old, was taken ill two weeks ago with acute otitis media of the right side and then of the left. After ten days the right ear ceased to discharge, and the temperature rose to over 40°, with anorexia, somnolence, and irritability. The child was admitted to the clinic on May 9, 1897. Temperature, 41.2°. The internal organs were found normal. The left auditory canal contained pus, and a pulsating light reflex was visible;

the right *Mt* was red and prominent. The mastoid processes were unchanged.

The right *Mt* was incised; serous fluid and blood escaped. The day following, the canal was filled with pus. Rectal temperature showed a fall of 5° , to 36.2° , on the morning of the two following days, with a rise to almost the same height in the evening. No other cause for the fever could be found than the tympanic inflammation. The discharge from both ears grew less, and the child made a rapid recovery. The temperature returned to the normal on the tenth day.

The temperature curve showed a pyæmic type with unusually pronounced daily variations. Koerner has observed a temperature decline of 4° in a few hours during otitic pyæmia; in our case the decline was 5° .

The systemic infection in this child may have occurred through the medium of a sinus phlebitis, or direct absorption from the tympanic mucous membrane. A sinus phlebitis is improbable, as there were no evidences of bony involvement, on account of the rapid fall of temperature after evacuation of the tympanic cavities and the absence of all meningeal symptoms.

CASE 3.—*Cholesteatoma, Sinus Thrombosis—Operation—Recovery.*

P. H., age twenty-nine years, has always suffered from right-sided otorrhœa which had recently been more profuse up to one week ago. The discharge then suddenly ceased; severe pains in the head set in, with chills and fever. He was admitted on September 24, 1897, complaining greatly of pain in the head. The right auditory canal contained a large polyp; the tympanic mucous membrane was granulating. The right mastoid process was tender along the posterior margin, but was not swollen. L ear normal. Temp. 38.2° ; no other symptoms of importance.

On the same evening the mastoid process was opened. The bone was found sclerosed. The sinus was encountered at a slight depth and situated far forward. The sinus was surrounded with pus, and granulations lined the bony wall of the sulcus transversus down to the jugular foramen. The discolored sinus pulsated after it was exposed for some length. The wall was covered with a grayish membrane, but no granulations. The antrum was next

exposed after Stacke's method ; it was found to be small at a high level, and contained a few granulations. A fistulous tract led to the diseased sinus. The sinus was finally incised, and a soft, dark clot evacuated, followed by free hemorrhage without pulsation. The wound was packed. The patient's recovery was uneventful, except for slight jaundice during four days. On October 20, 1897, the wound was closed with Koerner's plastic and healed twenty-seven days later.

Remarks.—This was a striking demonstration of the path of infection from the antrum to the sinus.

CASE 4.—Cholesteatoma, Sinus Phlebitis—Pyæmia—Operation—Meningitis Serosa Ventricularis Acuta—Death.

H. G., twenty-one years old, admitted September 24, 1897. The left ear has discharged since early youth. On September 19, 1897, patient felt severe pain in the left ear which radiated to the back of the neck. Temp. 40.2° . A large quantity of pus was removed from the left ear with the syringe. The left mastoid process was tender but not swollen. On September 22d renewed chills and fever over 40° . The condition of the patient then improved and on September 24th he was transferred to the clinic. On admission the temp. was 38.3° ; pulse good, cerebation good, ocular motility and pupils normal. The patient complained of occasional pain in the back of the neck. The left auditory canal led to a cavity filled with cholesteatomatous masses. An area corresponding to the mastoid vein was tender but not swollen. The right canal contained pus ; the *Mt* was perforated, otherwise normal.

On the following day, September 25, 1897, the radical operation was performed on the left side. The bone was eburnated, but soft and hyperæmic at the tip. Antrum, tympanum, and canal formed a large cavity, filled with cholesteatoma extending deep towards the tip and posteriorly to the sinus. The middle cranial fossa was exposed but found healthy. The sinus was exposed ; it was discolored but pulsated. There was a fistulous opening at the facial canal ; on probing, the spasmodic contractions appeared in the facial distribution. The sinus wall was accidentally torn ; free hemorrhage ; packing and bandage.

On return to consciousness, facial paresis observed. The temperature rose in the afternoon, with the same pain in the back of

the neck. Examination of the cervical vertebræ proved negative ; the spinous process of the fifth vertebra is unusually prominent, that of the fourth is deflected to one side, thickened and tender. Patellar and abdominal reflexes are feeble, but present. Internal organs normal.

The same symptoms were present on the following day ; pain in paroxysms and causing the patient to cry out. The pulse was slow in comparison with the temperature, sluggish and irregular. The condition unchanged on the second day, the wound appeared clean. No disturbance of the brain functions except horizontal nystagmus on looking to the right. Deglutition difficult and imperfect. The mind is clear ; no rigidity of neck. Examination of the ocular fundus could not be made. The patient grew comatose, with Cheyne-Stokes respiration ; the pulse rose from 64 to 140 ; death at 7 o'clock.

An autopsy was not permitted, so the wound was enlarged. The sinus was not thrombosed, as far as could be observed. The cerebral convolutions were flattened, no lepto-meningitis. The base of the middle cranial fossa normal. No abscess found in the cerebellum or cerebrum ; the left lateral ventricle greatly distended by a clear yellowish fluid (meningitis serosa).

From the high irregular fever and rigor, pyæmia was suspected. The wall of the sinus was found diseased but no thrombus.

In the following two days the fever continued, with pain in the neck. This we regarded as a symptom of a metastatic disease of the fourth cervical vertebra. On the third day, symptoms appeared suggestive of a further intracranial complication. Reasoning by exclusion, a cerebellar abscess seemed probable, supported by the symptom of nystagmus.

The rapid decline in the patient's condition and the uncertainty of the diagnosis made us abstain from further operation.

The post-mortem examination showed the absence of leptomeningitis and brain abscess, and the cause of death seems to have been a dilatation of the lateral ventricles, causing compression of the brain. Was this exudate due to an interference with the blood-current in the cranial cavity, or a meningitis serosa ? As a closure of the lateral sinus by

artificial means (ligature of the jugular, packing in hemorrhage from the sinus), or by thrombosis, does not usually cause a ventricular hydrops, meningitis serosa seems to be most probable.

The rapidly progressive brain symptoms, occurring within forty-eight hours after the operation, presume the possibility that by the concussion during the chiselling infection was carried to the ventricles. At any rate, puncture of the left ventricle would have alone cured the patient.

CASE 5.—Acute Suppuration in Both Temporal Bones, Presumably after Measles. Severe Pyæmia, with Multiple Joint-Metastases. Opening of Both Mastoid Abscesses, and of Three Joints. Death after Six Hours—No Autopsy.

Prof. Koerner has published this case, in the *Zeitschrift f. Ohrenheilk.*, vol. xxx., p. 231 (these ARCHIVES, vol. xxvi., No. 3).

CASE 6.—Thrombophlebitis of the Lateral Sinus. Purulent Leptomeningitis. Metastases in the Lungs.—Death.

Of this case, which entered the hospital in a moribund condition, we can only give the autopsy report. This is of interest, as it gives an exact picture of the metastatic inflammations in the internal organs in pyæmia.

Autopsy.—Body of a man about thirty-five years old. The veins of the cortex are congested. The upper wall of the left lateral sinus is transformed into a yellowish, cheesy mass. The longitudinal and the right lateral sinuses contain coagulated blood. The lower surface of the left cerebellar hemisphere is covered with a purulent membrane. Puriform masses have perforated the pia and have extended beneath this membrane. The purulent infiltration continues over the upper surface of the left cerebellum. In the post. fossa near the sigmoid sulcus, the bone is carious. The ventricles are distended with clear serum. The brain is otherwise normal. The pericardium contains some clear fluid. Heart normal. The left lung is adherent to the costal pleura. In the left lower lobe, there are two fluctuating prominences about $\frac{3}{4}$ cm in diameter. On section these prove to be abscess cavities. Many similar abscesses are scattered over the surface of the 3 lobes on the right side. Moderate changes in the other organs.

CASE 7.—Thrombophlebitis of the Right Lateral Sinus—Sepsis—Operation—Death.

M. W., twenty years old, was admitted on Oct. 18, 1897. The patient had complained of cough and fever for several weeks; a pulmonary affection was suspected. The left mastoid process became swollen, and she was sent to the hospital.

The patient is slightly jaundiced, temperature 40.2° , pulse 144-152. Pain only on coughing. She claims to see everything smoky. The mind is clear; no cerebral symptoms. Internal organs are normal. The right auditory canal is filled with pus and a large granuloma. The upper part of the right mastoid is normal, and free from pain. The tip and posterior margin are tender. The neck below is diffusely infiltrated and hard; this area extends behind the sterno-mastoid to the middle of the neck.

The mastoid process was immediately opened; the skin and periosteum bled very freely. The bone was soft in the antrum pit and near the tip, otherwise very hard and hyperæmic. Posteriorly, at a depth of 1 cm, a perisinuous abscess was encountered. The middle cranial fossa normal. The region of the sinus was curetted; owing to the very free hemorrhage no exact knowledge of the anatomical parts could be ascertained. The antrum filled with granulations. A track was found leading from the antrum to the perisinuous abscess. Packing. The incision was prolonged downwards, along the sterno-mastoid. Respiration during the operation was very bad, the patient did not rally, and died half an hour after the operation.

Autopsy.—October 20, 1897. No meningitis. The brain substance appears normal. No signs of abscess. The dura is unchanged except in region near mastoid antrum; the bone is bluish. The lateral sinus is ulcerated at the knee towards the bone. The neighboring bone is discolored and soft. Thrombus extends in the sinus half way back to the torcular. The thrombus is adherent to the wall and near the centre grayish green and soft. The jugular bulb is normal. The lungs show no signs of metastases. Spleen and liver enlarged.

The unusually extensive infiltration of the tissues about the occiput and the neck on the affected side is characteristic of the septic nature of the lesion (see Koerner, *Otitic Diseases of the Brain*, 2d edition, p. 94), similar to the diffuse swellings in the neck in septic diphtheria. This is the

third case of this kind which Prof. Koerner has been unable to cure by operation. According to his judgment, it is as well to leave these cases alone.

CASE 8.—Thrombophlebitis of the Lateral Sinus and Pulsating Abscess of the Sinus from Cholesteatoma in a Woman Seventy-four Years of Age, after Otorrhœa of Sixty Years' Duration—Operation—Recovery.

S. B., seventy-four years old, was admitted on May 18, 1897. In her fourteenth year the left ear began to discharge, but caused her no trouble until February 8, 1897, when she was taken ill with influenza and pneumonia and remained nine weeks in bed. A few days after the onset of the pneumonia the left ear began to pain, and the discharge ceased for the first time. The pain became very severe from March 6th to 10th, with high fever, rigor, and delirium. The region about the left ear was swollen and very tender. On March 10th, there was a spontaneous discharge of blood and pus, followed by general relief of the symptoms. Some pain persisted and she came to the clinic for treatment. The patient is emaciated. She hears loud conversational voice near the right ear. Except for the pain in the ear and general weakness, there are no symptoms. The left mastoid is tender, the overlying soft parts are swollen. The upper wall of the canal is bulging; the canal contains granulations and pus. The right ear, the internal organs, and the eyes are normal. On May 19, 1897, the radical operation was performed. The bone is hyperæmic and sclerosed. The bend of the sinus is exposed at a depth of $\frac{1}{2}$ cm; it is covered with granulations and pulsates. The antrum is situated to the inner side and extends behind the sinus; it is enlarged and filled with cholesteatomatous masses. The sinus is accidentally lacerated and pus escapes. The opening is enlarged and the sinus is further exposed. Pus but no blood appears. The antrum, middle ear, and canal are transformed into a large cholesteatomatous cavity. The bony cavity and the sinus are separately tamponed. On account of the sinus affection the wound was dressed daily. The wound cleaned itself and the secondary plastic operation (Koerner's) was made three weeks later, on June 10th. In the beginning of October the wound was healed.

This is an unusual case of intracranial complication after otorrhœa of sixty years' duration. The remarkable pulsating

sinus-abscess will be discussed at length farther on. A primary plastic operation was not feasible on account of the diseased sinus.

CASE 9.—Healed Otitic Phlebitis of the Left Cavernous Sinus.

A. F., thirteen years old, admitted on May 28, 1897, had suffered from otorrhœa of both ears for seven years. The discharge stopped on May 21st with high fever, rigor, and severe headache. After three days the otorrhœa began again; the symptoms were somewhat relieved, but headache, fever, and weakness remained.

On admission the temperature was 39°. The child appears very ill. The left auditory canal contains pus. The drum-membrane is swollen above, in front there is a perforation, several white shreds appear behind. The right drum-membrane has a large, dry proliferation. The internal organs are normal. The sensorium is free. There is marked deafness, and pain in the left half of the head. The pulse is 96, small and intermittent.

On May 28, 1897, the left antrum and tympanum are exposed, and the posterior wall of the auditory canal is removed. The bone is sclerosed. The granulations in the middle-ear spaces are curetted; the carious hammer and anvil are removed. The lateral sinus is exposed and found normal. Plastic.

On the following day the patient complained of diplopia; the left abducent nerve was paralyzed. Mind clear, pupils active. In the afternoon diarrhœa of typhoid character and abdominal pain set in; 7-8 small, raised roseolar spots appeared on the abdomen.

On the second day the sclera, skin, and urine showed jaundice color. Repeated vomiting. The left eyeball is distinctly prominent. Double choked disk (right more than left). The eruption had disappeared. No cerebral symptoms. The jaundice disappeared in five days. The eye symptoms improved, though after four weeks the right disk was still indistinct and the blood-vessels tortuous; the sixth-nerve paralysis was less.

On the fifth and seventh days, moderate hemorrhages from the sinus occurred in the dressings. On the sixth day the child's general condition was much improved. The temperature, which had reached 40.6°, gradually declined. The hearing was lost from the fifth to the seventh day. Four weeks later the left ear was still totally deaf, but the right ear could perceive whispering

voice. The healing of the wound progressed favorably ; a small area of necrosed bone was removed. On August 8, 1897, nine weeks after the operation, the patient was discharged healed. Whispering could then be heard

L. : twenty-two = 40 cm ; five = 20 cm ; hundred = 10 cm.
 R. : " = 400 " " = 300 " " = 100 "

The left-sided purulent otitis had led to the inflammation of the cavernous sinus, and to a general infection simulating typhoid fever. The diagnosis of disease of the cavernous sinus is assured from the abducent paralysis, the exophthalmos, and the double-choked disk. It is difficult to define the exact method of infection of the cavernous sinus. The carotid sinus, which surrounds the carotid in its bony canal, is contiguous with the tympanum, and communicates directly with the latter. On the other hand, one of the petrosal sinuses, or the lateral sinus, may have been affected without especial signs, and conveyed the infection to the cavernous sinus.

The transient bilateral deafness is remarkable. This will be discussed farther on with a case of complete central deafness from meningitis.

CENTRAL, PARTIAL, AND COMPLETE DEAFNESS DURING INFLAMMATORY PROCESSES WITHIN THE CRANIAL CAVITY.

In Case No. 9, the intracranial inflammation, with symptoms of a phlebitis of the cavernous sinus, led to transient central deafness.

The partial deafness in this case became total on the fifth, sixth, and seventh day, although no change occurred in the ears. The complete deafness coincided with the height of the temperature. The patient was somewhat apathetic, though reacted to everything except auditory impressions, and complained about her loss of hearing. This condition is suggestive of the so-called crossed deafness, which has been repeatedly noted in abscesses of the temporo-sphenoidal lobe. A bilateral deafness is, however, more probable than the crossed deafness in these cases, as the other ear had always suppurated, had been operated upon, and bandaged.

A bilateral central deafness may even have been present in those cases which, from the mentioned causes, had only been noted on the opposite side. Oppenheim states, with justice, that a one-sided disease in the temporal lobe cannot produce a severe or a lasting deafness on the opposite side, because each auditory nerve is in relations to both auditory spheres. In brain abscess, a severe and lasting crossed deafness has never been observed; the deafness has always been transitory.

How can we then explain the transient right-sided total deafness in Case No. 9? If the right ear had previously been normal, as in the cases of brain abscess with crossed deafness, it would probably have been only partly deaf. A central deafness may have been added to the previous peripheral partial deafness. As the patient recovered, the origin of the central deafness cannot be positively ascertained. It was perhaps due to a circulatory disturbance from disease of a sinus of uncertain extent. The case at any rate shows the possibility of a central deafness in a phlebitis at least of the cavernous sinus. The case leads us to report another case observed at the surgical clinic at about the same time.

CASE 10.—Traumatic Meningitis, with Pronounced Involvement of the Lateral Ventricles—Central Complete Deafness.

K. J., eight years old, was admitted on April 12, 1897. Twenty-two days ago he received a kick from a horse's hoof in the left ear, which knocked him down though it did not stun him. The left ear was swollen and presented a small wound. The patient vomited a number of times, but there was no discharge from the ear and no other symptoms. In the evening of the second day the child was feverish, restless, and complained of severe headache. In the night of the third day the boy suddenly lost his hearing. He could be made to understand only by gesture or by writing. The sensorium remained clear. The evening temperature was always raised between 38° and 40°. On day before admission patient had a severe chill.

On admission: No ocular symptoms. Hearing for conversation and loud noises lost. No signs of word-deafness or word-blindness. Pain in the left ear and occiput. No paralysis. The

region of the left ear is swollen. On palpation a depression admitting the thumb occupies the temporal squama and the parietal bone. The depression is oval, and the edges are sharp.

Prof. Koerner examined the ears and found the auditory canals and *Mtt* normal. No signs of exudate in the tympana. Total deafness for speech, bells, high and low tuning-forks. No bone-conduction. The patient is perfectly bright, can read writing, answers written questions, but does not react to unexpected noises, though he perceives the commotion caused by the slamming of the door.

Probable diagnosis: Abscess of the dura or of the brain probably in the left temporal lobe. On the second day the temperature again rose with chills, and on June 14, 1897, it was decided to open the skull.

Operation.—An oval Wagner flap was formed with the base corresponding to the depression above the left ear. On dividing the integument over the posterior end of the fracture half a teaspoon of purulent fluid appeared. A piece of bone corresponding to the skin incision is reflected. The dura is normal and pulsated; at the lower part near the depressed fracture an area of yellowish red granulation tissue is visible between the dura and the bone. This is very friable and is removed. The wound is partly closed with sutures and packing.

In the following days repeated vomiting and headache. Deafness persists. On June 16th the dura is opened and the brain is punctured with a scalpel to a depth of 3 *cm*, without result. June 16th, œdema of upper eyelid. June 18th, in the lower part of the wound the dura protrudes. An incision in that region evacuated pus and broken-down brain matter. A superficial abscess cavity is found in the temporal lobe. The pus contains streptococci. June 21st, general condition worse. The temperature varies daily between 37° and 40°. Punctures of the brain, without result, are frequently repeated.

July 16th, lumbar puncture is performed. The fluid is cloudy and contains many pus cells with diplococci and cocci in chains of four, resembling more the diplococcus lanceolatus than the meningococcus intracellularis. In cultures the staphylococcus alb. and spore-containing rods like the bacillus subtilis are grown. July 17th, gradual failing, restlessness, nystagmus, spasms of the right facial nerve, and convulsions. July 27th, death.

Autopsy, July 28th.—The left temporal lobe contains a cavity

filled with 50 *ccm* of cloudy yellow fluid. The pia over the base is normal. The pia over the pons, medulla, and cerebellum opaque and infiltrated with pus. The dura behind the area of the defect from the operation is covered by a brownish membrane. Vertical section through the hemispheres discloses the lateral ventricles, distended and containing 100 *ccm* greenish flocculent fluid. The ependyma is thickened and cloudy. In the left lateral ventricle, near the optic thalamus, the brain substance is broken down. The brain shows no other marked lesion.

Pathological Diagnosis.—White softening in the left temporal lobe. Pus in the distended lateral ventricles. Leptomeningitis in the posterior fossa.

In this case the bilateral total deafness occurring after an injury to the left temporal bone is of especial interest to us. The sound-conducting apparatus seems to have been unaffected, as the drum-membranes and the middle ears were normal. An injury to the labyrinth was possible, but there were no signs of a fracture of the base, and there was no escape of blood or cerebro-spinal fluid from the ear. In addition, the deafness did not come on until the third and fourth days. Furthermore, the traumatic abscess in the left temporal lobe could not have caused the complete deafness. We must, therefore, fall back upon the bilateral meningitis in the ventricles, as the etiological factor causing a disturbance in that portion of the brain where the two auditory tracts decussate. We know from Siebenmann's investigations that this takes place in the tegmentum.

THE PULSATORY MOVEMENTS OF THE EXPOSED LATERAL SINUS AND THE PULSATING SINUS-ABSCCESS.

The exposed lateral sinus often shows pulsation; this may be transmitted brain pulsation or waves of the normal Riegel's jugular pulsation recurring in the sinus. If the pulsations are transmitted by the blood-current, they show that the sinus is not thrombosed; if they are lateral movements only, they are of no other diagnostic importance than the brain pulsation itself. From our cases we were able to conclude that there was no sinus pulsation if the sinus

was only exposed for a short distance, and that a considerable part of its bony support had to be removed. This seems to show that the sinus pulsations are due to transmitted lateral movements of the brain. If the sinus or the mastoid vein are injured, pulsation does not occur, though the blood pressure was considerable. Hence the presence of pulsation does not allow us to conclude whether the sinus is thrombosed or not. In Case 3 a thrombosed sinus showed pulsation, and in Case 8 an abscess situated between two occluding thrombi pulsated. In conclusion it may be stated that **the pulsation of a sinus is of no diagnostic value.**

REPORT ON THE TRANSACTIONS OF THE
AMERICAN OTOLOGICAL SOCIETY AT ITS
MEETING JULY 19, 1898.

By HERMAN KNAPP, M.D.

The Society was called to order at 10 A.M. by the President,
ARTHUR MATHEWSON, of Brooklyn.

I.—DR. GORHAM BACON, New York: **A Case of Double Mastoid Disease, Presenting Symptoms of an Intracranial Complication; Operation; Recovery.**

"¹ The case was that of a boy, four years of age, who had a cold and complained of an earache. A few days later, the pain was quite severe and he had a temperature of 104° F. The left ear was first affected, and later the right. A free incision was made in each drumhead, as there was marked bulging. This was followed by a free discharge, and by a temporary improvement in the boy's general condition. As the mastoid processes were tender on pressure, the Leiter coil was applied on each side. Three days after making a free incision in each drumhead, it was deemed best to open the *left* mastoid process, as the temperature was about 104° F., and the boy's general condition did not improve. The sinus was laid bare, but was not opened, as it did not seem necessary. After the operation, the temperature fell to 102° F., but soon rose again to 104° F. On the following day, the *right* mastoid was opened and the sigmoid sinus was exposed. Very little pus was found in either mastoid process, but the bone was soft and there was granulation tissue.

A culture was made and pneumococci were found, with a few staphylococci.

Remarks.—The case presented symptoms of sinus thrombosis,

¹ Quotation marks indicate that the abstracts were furnished by the speakers.

but it was considered best to operate on both mastoid processes first, and to expose the sigmoid sinus on each side and watch the effect of such procedure, before resorting to the more serious operation of opening either sinus. The wisdom of this course was fully justified in the result of the operation, for the rise in temperature and other symptoms disappeared entirely, and the boy made an excellent recovery. The Leiter coil in such cases (viz., where pneumococci and streptococci are found) is of but little avail and in fact often masks the symptoms. If the temperature remains high after a free incision has been made in the membrana tympani, our attention should be immediately directed to the condition of the mastoid cells and the sigmoid sinus, remembering that the operation of opening the mastoid cells and exposing the sigmoid sinus is a comparatively safe procedure, if performed carefully and under strictly aseptic conditions."

Discussion.—Dr. GRÜNING, who was present at the operation, said that the walls of the sinuses were thickened, which made them suspicious of the presence of a clot. The sinuses were not opened owing to the absence of symptoms of sepsis.

Dr. F. B. SPRAGUE, of Providence, reported a similar case in a child. Temp. high; vomiting. Both drum-membranes punctured. Then left mastoid opened; pus in antrum; sinus exposed and punctured; escape of blood. The other mastoid opened, found more affected; the sinus exposed and slit; fluid blood escaped. Euphoria at first. Aggravation in a week. Apathy; coma. Cranial cavity opened, nothing found in middle fossa, nothing in brain. Opened the left mastoid again, nothing found in the cranium. The coma disappeared in a day. Patient felt better from the third day, when on changing the dressing a large quantity of pus escaped from the wound. Recovery.

Dr. KNAPP said that after opening the cranial cavity when no pus was found, pus might escape copiously a few days later. This fact was not unknown, and he himself, a few years ago, had communicated such a case to the Society, where, on account of grave meningitic symptoms, the diseased mastoid had been opened, and both the middle and posterior cranial fossæ exposed, without liberating pus, but two days later, while changing the dressing, a large quantity of foetid pus soaked the gauze. Rapid and permanent recovery.¹ He had asked himself where this pus

¹ *Trans. of Am. Otol. Soc.*, vi., p. 290.

had come from, and believed that it must have been penned in the jugular foramen, around the bulb of the vein.

His view was supported by an autopsy he made about ten years ago.

Dr. BLAKE confirmed Dr. Knapp's opinion.

II.—DR. J. E. SHEPHARD, of Brooklyn: **A Case of Sinus Thrombosis; Operation; Recovery.**

After grippe, earache, temp. 103° . Chills, temp. 105° . Weakness. Otorrhœa. Tenderness at posterior border of mastoid. Membrana tympani incised. Tip filled with pus. Extradural collection of pus. Temp. fell temporarily. Four days later lateral sinus opened, septic thrombus found. Both optic disks choked.

Another operation. The jugular vein found free from pus. The lateral sinus was opened toward torcular Herophili. Thrombosis and pus found, especially in bulb of jugular. Recovery.

Staphylococcus found.

Discussion.—Dr. GRÜNING, who was present during the operation, said that subnormal temperatures were sometimes met with in thrombosis, not in malaria. Dr. Shephard's patient also had felt well for a time.

III.—DR. J. ORNE GREEN, of Boston, demonstrated **Three Specimens of Suppuration of the Labyrinth, Two of them Producing Abscesses of the Cerebellum; Operations.**

"Three temporal bones showing caries in labyrinth, the effects of chronic suppuration of tympanum, all leading to infection of the cerebellum and abscesses in the anterior portion of that organ. In all, a full tympano-mastoid exenteration (radical operation) had been performed, and the caries of the labyrinth exposed, and the diagnosis of the cerebellar disease made. In all, the caries was essentially in the same positions, but more extensive in the third than in the other two. All showed a carious perforation into the vestibule, one eighth of an inch above the foramen ovale, a carious opening into the external semicircular canal through the wall of the aditus, and a carious perforation into the superior semicircular canal. In two the horizontal (tympanic) portion of the Fallopian canal had been destroyed, and in the third it was carious but not yet perforated."

He added another specimen. Caries of the *descending process of the incus*. The patient had been successfully operated on for *cholesteatoma* nine years ago. Nine months ago otorrhœa again. A drop of pus came down the attic. Ossicles removed; only the

descending process of anvil carious. Discharge ceased. Patient is well.

IV.—DR. C. J. BLAKE, of Boston : **Blood-Clot in Mastoid Operations.**

Dr. Blake for two years has tried to obtain healing by first intention, under a blood-clot, in operating on the mastoid both in acute and chronic cases. In both he obtained encouraging results. As soon as discharge set in, he removed the clot, yet there were cases where discharge appeared only in one corner of the wound, necessitating only the removal of the adjacent portion of the clot. He treated in this way 25 cases, 16 acute, 9 chronic. He wants to pursue this treatment longer before he gives a definite opinion as to the breadth of its applicability.

Dr. SPRAGUE has made similar experiments since 1893 ; ten cases, results satisfactory.

Dr. BACON has seen some of Dr. Blake's cases and found the results very satisfactory, even in chronic cases. He tried it years ago, particularly in acute cases.

Dr. E. A. CROCKETT tries to obtain primary union, opens only at appearance of discharge.

V.—DR. E. GRÜNING, New York : **Case of Abscess in Temporo-Sphenoidal Lobe ; Autopsy.**

Dr. Grüning related a very complicated case of brain abscess. Boy of seventeen years. Chronic otorrhœa, at times offensive. Headache, etc. Pulse 80, temp. 100°. Admitted to Mt. Sinai Hospital. Stupor, coma. Mastoid caries in antrum ; cholesteatoma. Complete exenteration of middle ear. On opening post. cranial fossa, an extradural abscess was found. A large quantity of pus escaped. Coma disappeared. No dizziness. Euphoria for a week ; at each dressing a large quantity of pus was liberated. No dizziness, no fever, but coma again. Another operation discovered and emptied a large abscess in the temporo-sphenoidal lobe. Death in a week. The autopsy showed that the abscess drained through a fistula into the post. cranial fossa.

Discussion.—Dr. GREEN wanted to know what course the fistula took, especially with regard to the tentorium cerebelli. Dr. Grüning said he had not been present at the autopsy and could not state the exact topographical relations.

VI.—DR. C. J. BLAKE makes a short communication : **How the Intracranial Pressure can be Utilized to Stop Hemorrhages in Accidental Wounding of a Sinus or an Artery.**

He removes the bony wall at the outer side of the sinus for a short distance. The intracranial pressure will then crowd the sinus against the bone at the border of the gap, and by bending and compressing it stop the hemorrhage. In certain cases he has found this procedure expedient.

VII.—DR. H. KNAPP: **The Functional Examination of the Ear; with Demonstration of Bezold's Continuous Tone Series.**

"We have to examine the perception of the intensity, pitch, and clang-tint of sound. The latter has not yet been tested. The first, intensity, gives us the patient's sharpness of hearing. Watch and acoumeters, though our views of noise and tone have changed, will, by their convenience, remain in use. The human voice is now universally acknowledged as the best testing means. The handling and interpreting it have largely a personal character. As every one has to try his own watch on a sufficient number of healthy ears, so he has to try the audibility of his voice, its strength as a given factor, and the dampening surroundings as resistances. The method of recording the acuteness of H as a fraction of the normal, long ago introduced in America, should be continued. For the detection of absolute deafness in one ear, Knapp has always obtained satisfactory results by using three tests: Dennert's, Weber's, and the one described by himself about fifteen years ago, when judiciously applied. The examination of pitch is important for diagnostic purposes. It has been brought to perfection by Bezold's continuous tone series, which of late has brought to light two very remarkable and important facts, 1. the preservation of portions of the scale in the hearing of deaf-mutes (hearing-remnants, tone-islets), which should be found out in every deaf-mute before a plan of his teaching is determined on in his particular case; 2. that the alleged hearing in labyrinthless ears is but a reflex, a pale photograph, of the hearing picture of the other ear, thus settling in the negative forever this old controversy of the hearing of labyrinthless ears."¹

Bezold's instruments were inspected by the members of the Society with great interest, and a lively

Discussion ensued as to the designation of the tuning-forks used in testing H. Dr. GREEN advocated always to write the letter, say

¹ A more detailed abstract of Dr. Knapp's communication will appear in the *Trans. of the Am. Otol. Soc.*, and the full paper is contained in this number of the ARCHIVES OF OTOLGY (August, 1898).

c^2 , and add the number of vibrations, single or double, etc. Dr. BLAKE said the numbers for the same tone were given differently by different authors, in the history of acoustics. Dr. KNAPP said that was so at the present day, and he would propose that we should use the values given by Helmholtz in his "Tonempfindungen." It was mentioned that an international agreement should be brought about. As to detecting one-sided deafness, Dr. BLAKE said that Dr. Knapp's test had given him reliable results. He uses a c^2 fork.

VIII.—DR. H. A. ALDERTON, Brooklyn: **Tuning-Fork Reactions in Affections of the Sound-Conducting Apparatus.**

"Gives the results of tests with Hartmann's set of tuning-forks, to which the C^{-1} fork was added. First gave the average normal reaction in seventeen cases, obtained with the same set of tuning-forks; then the average reaction in thirteen cases of cerumen and otitis media purulenta, both before and after treatment. These latter cases all having great impairment of hearing before treatment and practically normal hearing after."

Alderton arrives at the following conclusions:

1. The C^{-1} fork is unreliable in testing by B. C. In the normal ear Rinné is often given as negative with it.
2. The absolute duration of B. C. in lesions of the sound-conducting apparatus exclusively would seem to be diminished slightly from the normal.
3. A. C. is the more impaired the lower we go in the scale.
4. B. C. is maintained as well for the higher as for the lower forks. Certainly there is no decided falling off as the higher forks are reached.
5. There is an abbreviated positive duration Rinné for all except the C^{-1} fork, which gives a negative duration Rinné.
6. There is a negative intensity Rinné extending over the lower forks.
7. Improvement in hearing carries with it a withdrawal of the negative intensity Rinné towards the lower tone-limit.
8. Improvement in hearing increases A. C.
9. Improvement in hearing brings about also an increase in B. C. up to or above normal.
10. The Weber test, in the majority of cases, was changed from positive before treatment to equality after treatment.
11. The Galton whistle showed the upper tone-limit, which was at the mark 1.25 in the normal, to be lowered to 1.6 in diseases of

the sound-conducting apparatus previous to treatment, and elevated nearly to normal, viz., 1.38, after treatment. This slight lowering of the upper tone-limit in diseases of the sound-conducting apparatus confirms the earlier findings of the writer."

IX.—DR. H. A. ALDERTON: **Trephining of the Stapedial Footplate for Otitis Media Sclerosa.**

"Related the history of a case of otitis media sclerosa, in which the attempt to extract the stapes ruptured the crura without bringing away the footplate, but advanced the hearing distance from under four feet to over eighteen feet, probably by violently breaking up the bony and fibrous union of the footplate to the oval window. This improvement was only temporary, the hearing returning to its former condition.

At a subsequent sitting the footplate was trephined without any bad effects, but also without any improvement in the hearing. No dizziness followed, but only a strange commotion of sound. Autophony was complained of. There was no inflammatory reaction.

Doubts whether any permanent improvement in function is to be hoped for as the result of this procedure *in otitis media sclerosa*."

Discussion.—DR. JACK said that the removal of the stapes in two of his cases had produced a permanent improvement of hearing. DR. BLAKE spoke of some cases in which he had removed the whole stapes, or the limbs only. In one the hearing immediately after the operation was greatly improved, the patient was dizzy, and there was discharge of watery liquid from the ear. When the outflow stopped, the dizziness and also the improvement of hearing disappeared. DR. E. A. CROCKETT: In a case of removal of the stapes hearing improved, and was kept improved by Politzer's inflation. In a case of mobilization of the stapes with a fine hook, hearing was not improved, and vertigo ensued.

X.—DR. THEOBALD, of Baltimore: **Remarks upon the Treatment of Otomycosis by the Insufflation of Boracic Acid and Oxide of Zinc.**

"Seventeen years ago, in the *American Journal of Otology*, he had first called attention to this method of treating otomycosis, which he has since used in every case that he has met with, with uniformly favorable results. The fact that the majority of otologists still seem to adhere to the treatment of this affection by instillations of alcohol, which he thinks should long since have

become obsolete, led him to speak of the subject again. Alcohol is not a suitable agent to pour into an inflamed and painful ear, and its comparative inefficiency as a parasiticide seems to be shown by the fact that Hovell recommends that the instillations should be kept up for three months, and Politzer for a year, in order to prevent a regrowth of the fungus. On the other hand, one, two, or, at most, three applications of the oxide of zinc and boracic acid powder, which is blown lightly into the ear at intervals of twenty-four or forty-eight hours, effect as complete a removal of the parasite as possible, effectually destroy the fungus, and the powder is at the same time one of the best remedies we have for overcoming the attendant inflammation."

Discussion.—Dr. SUTPHEN found that boric acid powder alone cured otomycosis.

XI.—DR. ROBERT LEWIS, JR., of New York: **Extradural Abscess; Operation; Death.**

Chronic otorrhœa. Facial paralysis for two weeks. Removal of polypi and carious bone. Radical operation. Opening middle cranial fossa. Epidural abscess, in which tubercle bacilli were found. Three days later drowsy. Operated again. Ether. Patient asphyctic, requiring artificial respiration for two hours. Then Dr. Lewis went into the brain with an aspirator needle and withdrew cerebral liquid. In five hours patient expired. No autopsy.

Discussion.—Dr. GRÜNING thinks that the aspirator needle should not be longer than $1\frac{1}{2}$ inches. Dr. BLAKE said in one case where he had failed to find pus in the brain, it had been found at the autopsy situated in a recess of the bone over which the aspirator needle had passed.

The meeting of the Society was closed at 4.35 P.M. It was attended by thirty-nine members, and some guests who had been invited to take part in the discussions. A number of new members were elected. Dr. E. L. HOLMES, of Chicago, one of the oldest members of the Society, who, on account of ill-health, had sent in his resignation, was unanimously elected an honorary member.

The officers of the Society were re-elected, only Dr. VERMYNE, who for years had served the interests of the Society with the greatest punctuality and accuracy, was, on his resignation on account of ill-health, replaced by Dr. JACK of Boston.

SYSTEMATIC REPORT ON THE PROGRESS OF
OTOLOGY DURING THE FIRST QUARTER
OF THE YEAR 1898.

ARRANGED BY DR. A. HARTMANN.

Translated by Dr. ARNOLD H. KNAPP.

ANATOMY OF THE EAR.

1. HEGETSCHWEILER, J. The embryological development of the stapes. *Arch. Anat. u. Entwicklungsgeschichte*, 1898, Heft 1.

2. BRÜHL, G. New method to demonstrate the cavities of nose and ear. *Anatom. Anzeiger*, xiv., No. 2.

1. HEGETSCHWEILER found that the stapes first appears as an annular formation around the stapedia artery, derived from the hyoid arch, independent of the labyrinth wall. KRAUSE.

2. BRÜHL's method is: Injection of Hg into the free spaces of the decalcified and dehydrated bone, and clearing with xylol; further injection of Hg into the pneumatic cavities of the ear and the accessory cavities of the nose, and photography with the Röntgen rays. KRAUSE.

PHYSIOLOGY.

3. BRAUER, J. On semicircular canals and space-sense. Pflüger's *Arch. f. Phys.*, vol. 68, p. 596, 1897.

4. OSTMANN, J. On the action of the tensor tymp. muscle, etc. *Trans. of the Soc. of Naturalists*, Marburg, No. 1, 1898, p. 1.

5. HAMMERSCHLAG, V. Contributions to the embryological development of the mechanism of the cochlea. *Arch. f. Ohrenheilk.*, vol. 44, p. 101.

6. COLMAN, W. S. Further remarks on color-hearing. *Lancet*, Jan. 1, 1898,

3. The old controversy, especially against Cyon, continued.

4. On the function of the tensor tympani there are three different opinions: *a.* the muscle serves only as an elastic ligament in the conductive apparatus of sound; *b.* it is a protective apparatus against excessive sound waves; *c.* it is an apparatus of accommodation. OSTMANN concludes from the actual facts that (1) the presence of the tens. tymp. muscle is of little influence on the acuteness of sound; (2) absence of its action renders the ear insensitive for high tones; (3) it strongly checks the outward movements of the hammer and tymp. memb. Experiments on dogs seem to justify the conclusion that the muscle does not serve the accommodation of the ear for different conditions of sound.

5. HAMMERSCHLAG tries to support, by phylogenous development of the cochlea, the hypothesis that this organ is adapted as well for sensations of noises as for sensations of tones, an opinion which now is almost universally accepted.

6. COLMAN wrote papers on this interesting subject in the *Lancet* of March 31 and April 7, 1894. He deals with the faculty present in a considerable percentage of persons, of experiencing a sensation of color in association with certain sounds, the color being definite and invariable for the same sound.

The cases fall into two groups:

(1) A crude color sensation, often very beautiful, is associated with certain sounds, such as each of the vowel sounds, musical notes, or particular musical instruments; the appearance being usually that of a transparent colored film, similar to a rainbow, in front of the observer, but not obscuring objects.

(2) Color sensations whenever letters or written words (symbols of sound) are spoken or thought of, so that when a word is uttered the subject visualizes the letters, each of which has a distinctive tint. Interesting cases are related.

ARTHUR CHEATLE.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

7. GRUNERT, C. Annual reports of the Halle ear-clinic for 1895 and 1896. *Arch. f. Ohrenheilk.*, 44, p. 1.

8. SZENES. On traumatic lesions of the auditory organ. *Ann. des mal. de l'or., du lar.*, xxiv., 1.

7. These reports are prepared with the usual care. Several interesting histories of cases and operations deserve to be studied in the original. It seems that at Halle they are now beginning to operate with primary closure of the retro-auricular wound, a practice which the reviewer has followed for nearly four years with perfect satisfaction. BLOCH.

8. Of the seven reported cases, three were the result of a fall on the parietal bone, with subsequent deafness from concussion of the labyrinth; one was a fracture of the base of the skull with fracture of the auditory meatus and the hammer—the resulting deafness was referable to a lesion in the tympanum; one, injury to the auditory canal; one, fissure of the canal with severe labyrinthine symptoms, with complete recovery. In the seventh case, the diseased epitympanic recess was syringed with a weak lysol solution and under slight pressure; immediate signs of marked vertigo set in, with vomiting and slowing of the pulse to 56, and the patient had to keep to his bed for five days; later he was cured by a radical operation. ZIMMERMANN.

b.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

9. RANDALL, ALEXANDER. Tinnitus in its relation to nasal and aural affections. *Four. of Amer. Med. Assoc.*, vol. xxx., No. 12.

10. ALDERTON, H. A. Some unusual aural cases. *Annals of Otol., Rhinol., and Laryngol.*, vol. vii., p. 15.

11. BREITUNG. A case of diplacusis. *Deutsche medicin. Wochenschr.*, No. 9, 1898.

12. OSTMANN, Prof., Marburg. On the relation between the ear, nose, and throat, and on rational treatment of middle-ear disease. *Die Heilkunde*, Vienna, 1897.

13. DOWLING, FRANCIS. The relation existing between Bright's disease and certain ear symptoms. *Four. of Amer. Med. Assoc.*, vol. xxx., No. 13.

9. RANDALL divides tinnitus into an objective and subjective form. The subjective form is again subdivided into the cerebral, labyrinthine, tympanic, tubal, and the purely nasal forms of tinnitus. Before inaugurating treatment, a careful differential diagnosis is absolutely necessary.

10. ALDERTON reports the following cases: I. *A case of diplacusis binauralis echoica*. A young man, twenty-seven years

old, complaining of tinnitus and deafness in the left ear, with the c^3 fork placed on the mastoid process of the affected side (the finger in the right ear to shut out air-conduction), hears two notes, one a little later than the other; at the end of thirteen seconds the note heard by the left ear ceased, while that heard by the right ear continued to be heard for seventeen seconds more. The c^3 was the only one that gave such a reaction; as the patient was not musical, it was impossible to determine the interval. The explanation seems to be warranted that the right ear, because of its superior functional ability, heard the note as elicited, and across the head, even while the left ear was perceiving it. The pathological changes in the left ear must have been of a nature to alter the musical character of the note and to limit its duration, at the same time delaying its transmission, so that the effect of an echo was produced. Bone-conduction throughout, except for the c^4 , was reduced. The author assumes therefore a change in the transmitting as well as in the perceiving apparatus.

II. *Two cases of peculiarly shaped exostosis of the external auditory canal.* In a young lady, eighteen years of age, the examination of the left ear revealed the existence of a sharply defined pyramidal exostosis on the superior portion of the posterior canal-wall, 3 mm in height, and the same distance from the *Mt*, the apex pointing directly toward the short process of the malleus, a true cone; the apex white as ivory, and the whole hard to the touch of the probe. Growth still seemed taking place at the pinkish vascular base. In a man, forty years of age, the author found a similar exostosis as in the previous case, and likewise in the left ear, anteriorly, about 2 mm external to the bony edge of the pars epitympanica; the apex white and hard; pointing to the short process of the malleus. The growth, truly cone-shaped, about 2-2½ mm in height, the base pinkish. The rarity consists, according to the author, in the peculiarly sharp cone-shape, in the marked vascularity of the base, and in the absence of all cause for the growths except such as might be attributed to the gouty or rheumatic diathesis.

III. *Case of marked vertigo following stimulation of the nerve-endings of the middle ear, without any change in labyrinthine tension.* In a female, aged thirty years, suffering from an otitis media purulenta chronica, following measles, the author had removed the carious malleus and incus; on syringing or pressure on the stapes, vertigo can be produced. The vertigo, however, resulted

at times when a cotton-tipped probe was applied to regions of the middle-ear cavity so far removed from the labyrinthine fenestræ that an increased labyrinthine tension could be eliminated as the cause of the vertigo. The observed condition, on irritation, was: loss of balance, staggering with tendency to fall, dilatation of pupils. Patient has the feeling as though the eye-balls were turning round; a feeling of oppression in breathing; sighing respiration; pulse weak, but not accelerated; head moves to and fro; vision, for the time being, obscured. The author cites this case as one supporting Barr's theory (*British Medical Journal*, May 1, 1897), who believes that many cases of giddiness are not due to disturbance in labyrinthine tension, but to reflex action between the nerves distributed in the mucous membrane of the middle ear and the centre of equilibrium in the cerebellum, so that when the former are irritated, the latter is apt to be disturbed.

FELIX COHN.

11. A man, otherwise healthy, was suffering from catarrh of the Eustachian tube, and noticed that on whistling he perceived the tone double, with the left ear of the normal pitch, but with the right ear one half a tone higher. This phenomenon disappeared on catheterization. BREITUNG thinks that the diplacusis was caused by anomaly of tension in the drum-membrane acting reflexly through fibres of the fifth nerve on the auditory nerve.

NOLTENIUS.

12. OSTMANN describes the well-known connection between diseases of the middle ear and any pathological change in the nose and pharynx, and pleads for the proper treatment of the nose and pharynx before the ear proper is treated.

BRÜHL.

13. A limited number of cases of ear affections, accompanied by certain well-marked symptoms, such as tinnitus aurium, dull aching pain in the region of the mastoid, more or less reduction of the hearing power, slight irregularity of the gait, have been observed by DOWLING to occur in patients suffering from Bright's disease. Author cites two cases, and explains the aural symptoms with the theory that probably the retention of morbid matters in the blood produces a toxic irritation of the filaments of the nerves of hearing, as they spread out in the labyrinth, and possibly causes an albuminous degeneration similar to the condition known as retinitis albuminurica.

FELIX COHN.

c.—METHODS OF EXAMINATION AND TREATMENT.

14. POLITZER, A., Prof. Treatment of aural affections from the auditory canal. *Klinisch-therapeut. Wochenschr.*, Nos. 10 and 11, 1898.

15. FRIEDLANDER, E. Treatment of sclerosis of the tympanic mucous membrane with massage. *Berl. klin. Wochenschr.*, No. 12, 1898.

16. LUCAE, A., Prof. Remarks on Breitung's article on pneumatic massage of the drum-membrane with an electro-motor air-pump in the treatment of progressive deafness. *Deutsche medizin. Zeitung*, No. 91, 1897.

17. MARSHALL, M. E. What can be accomplished by treatment of Eustachian tube. *Four. Amer. Med. Assoc.*, xxx., No. 12.

18. MÉNIÈRE. The use of rubber bougies in the treatment of chronic catarrhal affections of the Eustachian tube and the middle ear. *Arch. internat. de lar., d'otol.*, xi., No. 1.

19. REYNIER and GLOVER. Anatomical relations of the cranium, the bony cavities of the face, and the cerebral sinuses studied by means of radiographs. *Rev. hebdom. de lar., d'otol.*, xix., 3.

20. LAUTENBACH, L. J. Some further results in treating ears by massage methods. *Four. of Amer. Med. Assoc.*, vol. xxx., No. 13.

14. POLITZER discusses the relative value of air-condensation, of air-rarefaction, and the alternating air-condensation and air-rarefaction (massage Delstanche) in diagnosis and treatment. He employs air-rarefaction (1) in the diagnosis of the degree of tension and resistance of the various parts of the drum-membrane; (2) to discover the seat of perforation when this does not become apparent with Valsalva or the air-douche; (3) to diagnose partial suppurations in the middle ear and possibly extradural abscess. In treatment air-rarefaction is of value (1) in middle-ear catarrhs with marked retraction of *Mt*; (2) to remove serous and mucous masses from the tympanum after paracentesis; (3) to remove the discharge in middle-ear suppuration; (4) in nervous deafness; (5) in subjective noises, and finally in cases of aural vertigo.

Air-condensation is diagnostically important in Gellé's test, and to restore the patency of the Eustachian tube in cases of perfora-

tion of the *Mt* and to irrigate through the Eustachian tube. Politzer recommends massage (Delstanche), especially in the treatment of middle-ear sclerosis.

POLLAK.

15. FRIEDLANDER has treated twenty cases of sclerosis with Wegener's "vibromasseur"; the subjective sensations were relieved in all except one case, though the hearing was unaffected.

MÜLLER.

16. LUCAE protests against the criticism of his results obtained by massage of the drum-membrane. The criticism is misunderstood, as Lucae's experience was obtained with the use of Delstanche's hand-pump and not with Breitung's apparatus. Lucae has obtained a simple guard by making a small opening in the rubber tube of Delstanche's instrument which serves as a safety-valve.

H.

17. MARSHALL recommends the use of bougies streaked with 3 % silver nitrate in lanolin, in the treatment of chronic stenosis of the Eustachian tubes. The bougie is to remain from twenty to thirty minutes, and is not to be applied more than twice in a week. Seventeen cases of chronic deafness and tinnitus were treated systematically; seven of these were greatly improved, five showed moderate improvement, and in five no change was to be found.

FELIX COHN.

18. MÉNIÈRE, assuming that catarrh of the Eustachian tube is the primary lesion which later causes changes in the middle ear and deafness, advocates the passage of bougies, a practice which has been dropped on many sides. He uses well-made rubber bougies, dipped in an iodine-potassium-iodide solution and left in place from one half a minute to one hour. In the two cited cases, which had been treated for a long time with a catheter without success, hearing was very much improved, though distinct swelling of the tubal mucous membrane was present.

ZIMMERMANN.

19. The topographical relations were studied with the aid of the X-rays after hardening and injection of the blood-vessels. The sinus usually occupied the posterior quarter of the mastoid, though in a few cases the centre and the anterior half; the younger the individual the more anterior was the sinus.

ZIMMERMANN.

20. LAUTENBACH again advocates his massage apparatus, and claims good results in a number of cases.

FELIX COHN.

EXTERNAL EAR.

21. HECHT, H. On the operative treatment of congenital lack of development of the auricle, with a case. *Arch. f. Ohrenheilk.*, vol. xlv., p. 89.

22. CARETTE. On foreign bodies in the auditory canal. *Ann. des mal. de l'or., du lar.*, xxiv., 2.

23. HAUG. Operative extraction of a foreign body from the ear. *Monatschr. f. Ohrenheilk.*, No. 2, 1898.

24. BRÜHL, G. A death after extraction of a foreign body from the ear. *Monatschr. f. Ohrenheilk.*, No. 2, 1898.

25. BREITUNG, M. Chorea minor. Foreign bodies in the ear. Recovery. *Centralbl. f. innere Medicin*, No. 10, 1898.

26. REID, ST. GEORGE. Traumatic rupture of the tympanic membrane. *Medical Press and Circular*, Feb. 23, 1898.

27. BIEHL, C. Closure of perforations of the drum-membrane. *Wiener klin. Wochenschr.*, No. 12, 1898.

28. SEISS, RALPH W. Acute myringitis. *Four. Amer. Med. Assoc.*, vol. xxx., No. 12.

21. A child, four months old, showed a combination of macrotia and microtia. The deformity was partly overcome notwithstanding suppuration during the healing process. BLOCH.

22. The bullet from a revolver became firmly imbedded in the auditory canal in front of the tympanic membrane without causing any other injury; the extraction was only effected after chiselling for 1½ hours. Recovery after four weeks.

ZIMMERMANN.

23. A carob-bean was removed after retraction of the auricle.

NOLTENIUS.

24. A child, four and a half years old, had introduced a stone in the ear, which the village barber had unsuccessfully attempted to remove. A violent inflammation of the canal and the middle-ear spaces ensued. The foreign body was removed by operation, and the antrum and the lateral sinus were exposed. The child, notwithstanding, succumbed to lateral sinus thrombosis and pyæmia. Probably a middle-ear suppuration had existed previously.

KILLIAN.

25. The patient, thirteen years of age, became deaf after diphtheria five years ago, and had suffered from chorea minor for two years. A foreign body was found in the ear on examina-

tion, which was removed by syringing, and proved to be a piece of pencil. At the time of her discharge, three weeks later, the chorea had disappeared. HARTMANN.

26. A child, aged nine years, fell on the point of her chin and ruptured the drum by indirect violence. ARTHUR CHEATLE.

27. BIEHL confirms the favorable results after cauterizing the edges of a perforation with trichlor-acetic acid. He applied a 10 to 50 % solution with the cotton-tipped probe at intervals of four to eight days. POLLAK.

28. SEISS refers to the fact that myringitis is a disease which is usually disposed of very briefly in text-books, and the object of the paper is to call attention to an apparent want in modern otological literature in regard to the classification of acute otitis, the prevalent opinion being to classify myringitis under acute otitis. He divides acute myringitis into the simple, desquamative, hemorrhagic, and suppurative varieties. The suppurative variety is, according to the author, more often a primary disease than is generally assumed. FELIX COHN.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

29. DENCH, EDWARD B. The surgical treatment of acute inflammations of the middle ear. *Four. Amer. Med. Assoc.*, vol. xxx., No. 12.

30. PANZER, B. Purulent extension during inflammatory affections of the middle ear. *Wiener klin. Rundschau*, Nos. 12 and 13, 1898.

29. DENCH recognizes two forms of inflammation of the middle ear, one affecting primarily the atrium, and the other the vault of the tympanum. The inflammation of the atrium is usually catarrhal, and, owing to the small amount of connective tissue within this space, suppurative inflammations are practically impossible. The inflammation in the tympanic vault generally leads to connective-tissue necrosis and the formation of pus; the inflammation in this region therefore constitutes a true cellulitis. While in the catarrhal inflammation antiphlogistic measures usually suffice, operative treatment is imperative even in the incipient inflammations of the tympanic vault. The author generally employs a small knife resembling a tenotome, the blade being about three quarters of an inch in length, instead of the

old form of myringotome. In cases of suppuration of the tympanic vault, a stronger knife, and one having the blade a little curved, is preferable.

FELIX COHN.

30. PANZER describes four cases of purulent extension in otitis media which had previously been operated upon. In one case the pus burrowed back toward the occiput, causing elevation of the periosteum, caries of the bone, and exposing the dura. In the second and third cases an abscess descended into the neck with periostitis of the cranial roof, caries, and extradural abscess. In the fourth case a remarkable perforation took place toward the zygoma.

POLLAK.

b.—CHRONIC PURULENT OTITIS.

31. KRAUS, E., Paris. A new treatment for chronic purulent otitis. *Allgem. Wiener med. Zeitung*, No. 12, 1898.

32. KRETSCHMANN, Magdeburg. Clinical and pathological contributions on caries of the malleus and the incus. *Festschrift zur Feier des 50 jährigen Bestehens der medicinischen Gesellschaft zu Magdeburg*, 1898.

33. BURNETT, CHARLES HENRY. Intratympanic surgery especially in chronic purulent otitis media. *Four. Amer. Med. Assoc.*, vol. xxx., No. 12.

34. STUCKY, J. A. Ossiculectomy in chronic suppuration of the middle ear. *Four. Amer. Med. Assoc.*, vol. xxx., No. 13.

35. PIERCE, H. NORVAL. Removal of the ossicles, with report of six cases. *Four. Amer. Med. Assoc.*, vol. xxx., No. 13.

36. WOODS, HIRAM. Three cases of suppurative otitis media; severe systemic and remote disturbances; recovery after mastoid operation and removal of polypi. *Four. Amer. Med. Assoc.*, vol. xxx., No. 12.

37. BRYAN, J. H. Report of two cases of suppurating mastoiditis. *Four. Amer. Med. Assoc.*, vol. xxx., No. 10.

31. KRAUS has cured four cases of chronic otorrhœa with the insufflation of traumatol (iodocresyl).

POLLAK.

32. KRETSCHMANN's careful investigations on caries of the ossicles are based on 64 hammers and 41 anvils removed from 70 diseased ears, of which 35 were extracted through the auditory canal and 35 at the time of the radical operation. The anvil was found more frequently carious, and the long process was more usu-

ally affected than the short one. The body of the anvil was found regularly diseased with one of the processes, except in one case (tubercular), where the body alone was affected. The articular surfaces remain the longest uninvolved. The head of the hammer is the portion of that body most frequently affected, especially on its outer and anterior surface. The articular surface usually remained uninvolved. The handle was less frequently diseased, particularly in the region of the short process and the lower part of the neck. Anchylosis of the hammer-anvil joint was present four times. Cicatrization of defects in the anvil were found five times; caries of the ossicles can thus be healed without operation.

Caries of the parts of the ossicles situated in the attic is usually the result of an inflammation in the hammer-anvil depression. This depression, as has been shown by casts, is a space usually shut off from the tympanic cavity. The suppurations in this locality, however, usually originate in the tympanum. The suppurative process often commences insidiously and runs a chronic course, or persists in the depression after the suppuration in the tympanum, and leads to caries of the ossicles. The caries usually begins at the above-mentioned places, which offer, from their relation to the depression or the absence of protecting ligaments, a favorable site for the destructive process.

Caries of the ossicles is recognized from the well-known symptoms (Schwartz, Panse, Grunert). Whether the ossicles alone are diseased or not is usually only shown by the result of the treatment.

Recoveries are often obtained by irrigations with the tympanic canula. When this is unsuccessful and the existence of isolated caries is probable, the extraction of the ossicles is indicated. The results are favorable (55 % cured). Hearing is usually improved. Stacke's operation is reserved for the complicated cases and where the canal is narrow.

Kretschmann has modified his anvil hook.

KÖRNER.

33. BURNETT gives a very interesting report of his experience in intratympanic surgical interference, especially in chronic purulent otitis media. As he evidently has had a large experience in that direction, having performed the operation 109 times, a report of his results must be instructive. The operation was performed 43 times for the relief of chronic catarrhal deafness and tinnitus, 26 times for the relief of chronic tinnitus and tympanic vertigo of catarrhal origin, and 30 times for the relief of chronic puru-

lency of the middle ear. The last 30 cases are reported at length, and the results obtained were as follows: Total cessation of discharge in 15 cases, marked diminution in 7, and diminution simply in 8. Total cessation of discharge occurred five times within two months, three times in one month; four times in two weeks, once in a year, and once in a year and a half. The attic alone was affected in nine, the atrium alone in seven, and the attic and atrium together in fourteen cases. In no instance was the stapes resected or removed. The after-treatment consisted in alcohol instillations or alcoholic solutions of boric acid or acetanilid as long as signs of granulations were present. After the disappearance of the granulations, a 2½ % carbolic acid solution or a solution of bichlorid (1:6000) acted best. Hearing was improved in fifteen cases, unaltered in ten; in five instances was unrecorded.

FELIX COHN.

34. Thirty-six cases of ossiculectomy in chronic suppurative inflammations are reported by STUCKY, and the following results were obtained. In thirty cases suppuration ceased, and hearing was improved from ten to twenty per cent.; all uneasiness in head and ear relieved. In four cases the suppuration stopped entirely for several months, then returned, the recurrence due to the formation of granulations. In two cases results, so far as relief of suppuration, negative. These cases, however, were afterwards found to be tubercular. In eleven cases the incus could not be found, and only a part of the malleus. In the remaining twenty-five cases the entire remaining portions of the malleus and incus were removed. The greatest amount of necrosis was observed in the incus.

FELIX COHN.

35. PIERCE reports six cases in which the tympanic membrane and one or more of the ossicles were removed. Two of them chronic suppurative, three chronic sclerosing, and one chronic catarrhal inflammation. He formulates the following indications for the removal of the ossicles: 1. When the perforation, situated anywhere in the pars tensa, is small, and the membrane thickened, and the discharge copious, offensive, and has resisted continuous treatment by means of gauze drain for one month. 2. Where the perforation is small, the membrane thickened, the discharge scanty, but odorous. 3. When more or less of the pars tensa has been lost, but the discharge continues, evidently coming from the attic. 4. When any of the indications already formulated by Schwartze or Grunert are present (*Arch. f. Ohrenheilk.*,

xxxiii., p. 207). Author further considers operation rational in catarrhal deafness, but not in cases of deafness due to sclerosis.

FELIX COHN.

36. WOODS reports three cases as examples of severe systemic disturbances without very great change in the mastoid bone. In the first case in which the mastoid complication was accompanied by a painless otorrhœa, there were septic symptoms for five days and only about one drop of pus found in the mastoid. In a second case of mastoid inflammation following scarlatina, the process was opened without finding either pus or a carious point in cortex. In the third case reported, symptoms resembling intracranial complications were relieved by thorough curettement of middle ear, which had been blocked by polypi. Author compares these cases to cases of acute cellulitis, in which the constitutional symptoms likewise disappear when the infected area is drained.

FELIX COHN.

37. The evil results following the indiscriminate application of poultices and the injudicious use of the air-bag are ably demonstrated by BRYAN. The author reports two severe cases of deep abscesses of neck, extensive caries of the mastoid following the use of poultices and the air-bag in acute suppurating otitis media. In both cases extensive incision of deep abscess and opening of mastoid effected a cure.

FELIX COHN.

c.—CEREBRAL COMPLICATIONS OF PURULENT OTITIS.

38. KNAPP, HERMAN. Acute and chronic caries and necrosis of the mastoid; pachymeningitis externa; epidural abscess. *Four. Amer. Med. Assoc.*, vol. xxx., No. 12.

39. BELL, JAMES. A case of abscess of the temporo-sphenoidal lobe presenting unusual features. Operations. Recovery.

40. GRADENIGO. On the endo-cranial complications of purulent otitis. *Ann. des mal. de l'or., du lar.*, xxiv., 2.

41. THOMAS and CATREIL. Cholesteatoma; cerebral abscess; unsuccessful punctures on the forty-first day of treatment; sudden death on the fifty-fifth day. *Rev. hebdom. de lar., d'otol.*, xix., 9.

42. BOJEW. Several cases of pyæmia of otitic origin. *Rev. hebdom. de lar., d'otol.*, xix., 8.

43. WOODS, R. H. A case of middle-ear disease. *Dublin Four. of Med. Science*, Feb., 1898.

38. KNAPP illustrates the course of acute mastoid caries in a number of interesting abstracts of case histories selected from his recent practice. The nine cases selected constitute a series of progressive acute and chronic destruction with extension into the cranial cavity. Eight cases in which timely and sufficient operations were performed recovered. One case in which there was no surgical interference ended in death by epidural abscess. The author, before entering into the report of the cases, gives a brief review of the symptomatology of mastoid caries.

FELIX COHN.

39. A case of abscess of the temporo-sphenoidal lobe is reported by BELL. The unusual features of the case consisted in the occurrence of fits of an epileptiform nature two and a half months after the patient had been discharged from the hospital. The convulsions lasted for a period of from four to six weeks and gradually disappeared.

FELIX COHN.

40. During the last two years GRADENIGO has observed and operated on 21 extradural abscesses, 9 sinus thromboses, 10 leptomeningitides, 4 cerebral and 2 cerebellar abscesses. The accompanying remarks are brief, but of no especial interest.

ZIMMERMANN.

41. It is not certain whether an abscess was present, as none was found at the operation, and no autopsy was made. The patient died on sitting up suddenly; the abscess had possibly broken into the ventricle. Punctures were made only in the temporal and frontal lobes.

ZIMMERMANN.

42. BOJEW considers pyæmia a sign of sinus-thrombosis, though in his 8 cases this was confirmed in only 5 either by operation or autopsy. In the remaining 3 cases the sinus was not exposed in 2; in the third the sinus was exposed, and the jugular vein was ligated, though nothing is stated about the condition found.

ZIMMERMANN.

43. At a meeting of the Royal Academy of Medicine in Ireland, held November 12, 1897, WOODS related the case of a man, aged twenty-seven years. A discharge had been present from the ear for seven years. Seven days before he was admitted with symptoms of typhoid fever, the discharge had ceased. Operations revealed septic thrombosis of the lateral sinus, extradural abscess in the posterior fossa, and an abscess in the temporo-sphenoidal lobe containing four drachms of pus. Recovery occurred.

ARTHUR CHEATLE.

d.—OTHER MIDDLE-EAR AFFECTIONS.

44. MALHERBE. Some additional cases of aural catarrh treated by the mastoid operation. *Arch. internat. de lar., d'otol.*, xi., 1.

45. GLEASON, E. B. Phenomena observed in twelve cases at various stages of the operation for section of the incudo-stapedial articulation and mobilization of the stapes. *Four. Amer. Med. Assoc.*, vol. xxx., No. 10.

46. MATTE. Absolute indication for the tenotomy of the tensor tympani in a complicated fracture of the skull. *Deutsche med. Wochenschr.*, No. 5, 1898.

44. To the sixteen cases previously published, MALHERBE adds five more where he believes to have had good results from the mastoid operation. Exact functional examinations are again missing. The less advanced the deafness, the better the results.

ZIMMERMANN.

45. Twelve cases of advanced sclerotic catarrh of the middle ear were selected by GLEASON. In some an attempt was made to mobilize the chain of ossicles by traction in various directions upon the lower portion of the long process of the incus. In others the tendon of the stapedius muscle was severed, and subsequent traction made upon the incus. In other cases the incudo-stapedial articulation was severed and a direct mobilization of the stapes attempted by means of lateral pressure and lever-like movements with a cotton-tipped probe in direct contact with the head of the stapes.

Careful functional tests proved that not the slightest improvement followed the incision of the drumhead and the turning forward of the flap. Nor was any improvement effected by subsequent manipulation of the incus. The section of the stapedius, performed in two cases, was followed by an immediate improvement of hearing. In both cases further improvement followed the incision of the incudo-stapedial articulation and mobilization of the stapes. Tinnitus was relieved in all cases. In five cases only was there any noticeable and practical improvement of hearing. The improvement, however, was not lasting, and invariably disappeared within a few months after the operation.

FELIX COHN.

46. A woman, nineteen years old, fell from a considerable height and sustained a fracture of the skull. Several months

later she applied at the ear-clinic on account of annoying subjective noises in the affected ear. On examination the labyrinth was found intact. From the facial paresis and the line of the fracture in the auditory meatus it could be decided that the facial nerve had been injured at its turn from the tympanum to the mastoid. Thus the stapedius and all the muscles of the face had been paralyzed. The loss of function of the stapedius muscle permitted the unrestrained action of the tensor tympani, with increased pressure within the labyrinth and subjective sensations. The tenotomy of the latter muscle was performed under cocaine anaesthesia, and the annoying subjective symptoms disappeared permanently.

NOLTENIUS.

NERVOUS APPARATUS.

47. BING, A. A typical case of Ménière's disease. Recovery. *Wiener med. Wochenschr.*, No. 4, 1898.

48. ALT, F., Vienna. The influence of increased intracranial pressure on the sound-perceiving apparatus. *Monatschr. f. Ohrenheilk.*, No. 3, 1898.

49. ALT, F. A contribution to the pathology of the cortical auditory centre. *Monatschr. f. Ohrenheilk.*, No. 1, 1898.

50. LIEBMANN, A., Berlin. Congenital psychical deafness. *Allgem. med. Central-Zeitung*, No. 31, 1898.

47. Supplementary to the history of the case, BING advises the abandonment of the terms, Ménière's symptoms and Ménière's symptom-complex, and advocates the term morbus Ménière for the apoplectic form.

POLLAK.

48. With increased intracranial pressure, interstitial lymphatic infiltration of the auditory nerve was found; likewise an injury to Corti's organ from depression of Reissner's membrane. The auditory centres may also suffer, especially in ac. and chr. hydrocephalus, from oedema, softening and shrinking of the auditory nuclei. According to ALT, the examination with tuning-forks or the electrical examination of the auditory nerves in brain tumor do not furnish any reliable results.

KILLIAN.

49. ALT cites the cases in the literature. Unquestionably the first temporal convolution is in communication with the auditory organ of the opposite side. There is probably also a communication with the ear of the same side. Focal lesions in the left temporal lobe can be diagnosticated. Alt gives the history of a case of this kind.

KILLIAN.

50. LIEBMANN divided deaf-mute children in three classes. The first class contains the purely motor cases. The children do not learn to talk because their organ of speech is too clumsy to imitate the words heard. The second class is combined motor and sensory. The speaking knowledge embraces only a few words; these children do not understand an entire sentence. In sensory deaf-mutism the children do not understand speech. The children hear the words and repeat them like an echo, though without understanding. They make themselves understood by gestures.

A boy, six years old, could not understand the simplest words, as papa, mamma, table, etc., and could not repeat a word which he had just spoken. The psychical deafness was caused by high-grade inattention and lack of memory. After five months of treatment the boy possessed a large vocabulary which he understood, and later was able to attend the high school. H.

NOSE AND NASO-PHARYNX.

a.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

51. PARK and WRIGHT. The bacteria of the normal nose. *Ann. des mal. de l'or, du lar.*, xxiv., 2.

52. GUDER. The effect of irritations of the nasal mucous membrane on the heart and the pulse. *Ann. des mal. de l'or., du lar.*, xxiv., 1.

53. KRIEG, Stuttgart. Probable diagnosis of diseases of the nose and throat and of the general organism based on the appearance of the nose. *Sammlung zwangloser Abhandlungen*, ii., 3, 1897.

51. According to PARK and WRIGHT, the nasal secretion has not the bactericidal property which Wurtz and Lermoyez believe it to have; this agrees with the views of Klemperer and Wertheim.

ZIMMERMANN.

52. The author concludes that the connection between the nasal mucous membrane and the heart action is not a direct one but a reflex one acting through the trigeminus, as is customary in patients disposed thereto.

ZIMMERMANN.

53. KRIEG from twenty-four cases endeavors to show the possibility of making probable diagnoses of nose and throat affection from the examination of the internal organs, and on the other hand from appearances of the nose and throat to diagnosticate affections in distant organs.

BRÜHL.

b.—METHODS OF EXAMINATION AND TREATMENT.

54. TAPTAS. Hypnotic suggestion in nasal disease. *Rev. hebdom. de lar., d'otol.*, xix., 5.

55. WAGGETT, E. New instrument—turbinotomy cautery. *Proceedings of the Laryngological Society of London*, Jan. 12, 1898.

56. MYLES, ROBERT C. Surgery of the middle and inferior turbinated bodies. *New York Med. Jour.*, March 19, 1898.

57. AMBERG, E. A new nasal speculum. *Monatschr. f. Ohrenheilk.*, No. 1, 1898.

58. KIRSTEIN. A tongue-depressor. *Berl. klin. Wochenschr.*, No. 12, 1898.

54. A rhinitis with ridge-like hypertrophies of the turbinates, interfering greatly with respiration, was so much relieved after two sittings of hypnotic suggestion as to cause no further annoyance.

ZIMMERMANN.

55. WAGGETT showed a galvano-cautery point, practically of the same shape as Jones's turbinotome, a hot platinum wire taking the place of the cutting edge. Hemorrhage is thus avoided in removing hypertrophies of the turbinal bodies. The copper wire should be thick so as to avoid overheating by the current.

ARTHUR CHEATLE.

56. Turbinotomy of the inferior body and bone is done with saw, scissors, and snare successively, that of the middle with MYLES's alligator forceps and the snare. The steps of these two operations are clearly illustrated by six pictures. The operation is indicated in resistant turbinates touching a fairly straight septum in patients of rheumatic tendency or subject to rose cold and hay fever. Four histories of cases are appended. M. TOEPLITZ.

57. This is a modification of Hartmann's speculum.

KILLIAN.

58. This instrument is devised by the author especially to serve in his method of examination—autoscopy of the larynx.

MÜLLER.

c.—NASAL SEPTUM.

59. MAYER, EMIL. The Asch operation for deviations of the cartilaginous septum, with a report of two hundred operations. *Med. Record*, Feb. 5, 1898.

60. COBB, C. FRED. Fractures of the nasal bones. *Four. Amer. Med. Assoc.*, March 12, 1898.

59. Among the 200 operations performed in New York institutions, 39 were operated by ASCH and 35 by MAYER. Among 122 cases observed by Mayer 96 were males and 26 females; the average age of all was twenty years. The steps of the operation, the instruments, and splints are well described and illustrated. The lower segment, if it remains thickened after five weeks, is removed by the electro-trephine or galvano-cautery knife. In a case of recent fracture of the nasal bone with deviation of the septum, Mayer compressed and straightened the septum with the nasal forceps and inserted a splint shaped like a truncated cone. Eighty-five per cent. of the 74 cases operated by Asch and Mayer were cured with perfectly straight septums, the remainder without stenosis. Perforations of the septum of the size of a pin's head occurred in two per cent.

M. TOEPLITZ.

60. COBB holds that by the fracture of the nasal bones the septum is also dislocated from its bony attachments, and that by replacing the nasal bones and holding them from the outside in position by a truss, the septum also becomes straight if supported inside. The truss consists of a spring pressing against the nasal bone, attached to a head band, which is secured by a strap crossing the head and another around the chin. Two illustrative cases are appended.

M. TOEPLITZ.

d.—ACCESSORY CAVITIES.

61. KUNERT, A. The differential diagnosis between cysts and empyema of the antrum. *Arch. f. Laryngol.*, vii., 1.

62. WINCKLER. The surgery of the upper nasal accessory cavities. *Arch. f. Laryngol.*, vii., 1.

63. MOURE. The treatment of diseases of the sinuses, excepting the maxillary. *Rev. hebdom. de lar., d'otol.*, xxi., 10, 11, 12.

64. MEGJES, Amsterdam. The treatment of empyema of the antrum. *Monatschr. f. Ohrenheilk.*, No. 1, 1898.

65. HERSFELD, J., Berlin. A simple method of closing and keeping open the artificial opening in the maxillary antrum. *Monatschr. f. Ohrenheilk.*, No. 1, 1898.

66. BRINDEL. Inflammation of the sinuses and broncho-pulmonary complications. *Rev. hebdom. de lar., d'otol.*, xix., 6.

67. WAGGETT, E. Radical operation for frontal-sinus dis-

ease. *Proceedings of the Laryngological Society of London*, Jan. 12, 1898.

68. SPIESS, GUSTAV., Frankfort-a-M. The surgery of the sphenoidal sinus. *Arch. f. Laryngol.*, vii., 1.

61. The author believes that cysts of the antrum with purulent contents and empyema of the antrum are often confounded. He concludes: (1) That the mere presence of pus in the antrum is not sufficient for the diagnosis of an empyema. (2) The evacuation of pus through a fistula by means of the air blown in the maxillary opening, and the passage of a probe through a fistula for several centimetres toward the region of the antrum, make the diagnosis of a cyst probable; while (3) the diagnosis is assured when the bony walls are distended, with preservation of the contours.

ZARNIKO.

62. Grünwald's methods for opening the frontal and ethmoid sinuses give good cosmetic results, but do not give a sufficiently broad view. The methods of Jansen, Kuhnt, and Killian are open to the same objections. The author has therefore combined Killian's with Roser's method; he has also employed Ollier's and Gussenbauer's methods, and has operated on the most difficult cases with success. A method is described to gain a view of the cerebral surface of the frontal wall. It is often difficult to follow the author's description from lack of diagrams, and literature references of the authors quoted are wanting.

ZARNIKO.

63. MOURE distinguishes three forms: (1) intermittent mucopurulent secretion; (2) constant purulent secretion with chronic inflammatory swelling and polypi; and (3) granulations and sequestra with the production of fistulous perforations. The treatment is not new. For the mild cases irrigations are employed. In the other cases a free outlet for the pus must be obtained and the diseased mucous membrane directly treated. In the case of the frontal sinus he employs Luc's method.

ZIMMERMANN.

64. Advocates an alveolar antrum canula with valve-like closure.

KILLIAN.

65. HERSFELD uses a rubber cork of conical shape with a flattened head to keep open the artificial antral fistula.

KILLIAN.

66. The histories of two cases where an antrum empyema existed with suspicion of phthisis, and one case where both diseases existed.

ZIMMERMANN.

67. WAGGETT performed Luc's operation. The cavity was completely cleared of all the mucous membrane, which was throughout polypoid. The drainage-tube was removed on the thirteenth day. No pus was seen after the operation.

ARTHUR CHEATLE.

68. The author has devised an electro-motor probe-trephine to open into the sphenoid cells and which cannot enter too deep.

ZARNIKO.

c.—TUMORS.

69. MARTHA. Statistical investigations on mucous polypi in the nasal fossæ of the child and the adult. *Ann. des mal. de l'or., du lar.*, xxiv., 1.

70. TISSIER. Tumors of the nose and the sinuses. *Ann. de l'or., du lar.*, xxiv., 1.

71. PIERCE, N. H. The so-called bleeding polyp of the septum. *Four. Amer. Med. Assoc.*, Feb. 19, 1898.

72. NICHOLS, JAMES E. Sarcoma of the nasal passages. *New York Med. Four.*, Jan. 8, 1898.

73. GLASGOW, W. C. Angioma of the nose. *New York Med. Four.*, Jan. 8, 1898.

74. SWAIN, H. L. Nasal and other polypi. *New York Med. Record*, March 12, 1898.

75. BALL, J. B. Case of fibro-sarcoma of the nasal septum. *Proceedings of the Laryngological Society of London*, Nov. 10, 1897.

76. HOPKINS, F. E. A case of adeno-carcinoma of the nose. *Arch. f. Laryngol.*, vii., 1.

77. WRIGHT, JONATHAN. Papillary œdematous nasal polypi and their relation to the adenoma and adeno-carcinoma. *Arch. f. Laryngol.*, vii., 1.

69. During four years 133 cases of nasal polypi were observed at Pereire's clinic; of these only 2 occurred in children under fifteen. The latter cases are briefly described. The polyp was situated in the middle meatus.

ZIMMERMANN.

70. A comprehensive and complete review of all the published cases, with remarks and references.

ZIMMERMANN.

71. CASE I. A boy, aged six, presented a tumor of the size of a large pea, projecting from the left side of the septum at the junction of the triangular cartilage with the vomer, which had

recurred after operation. It was a fibroma polyposum fungoides telangiectoides.

CASE 2. A girl, aged fifteen, had also such a tumor of the left side of the septum, which did not recur after second removal and subsequent cauterizations. These tumors are more frequent about puberty.

M. TOEPLITZ.

72. CASE 1. Male, aged thirty-nine, presented, October 7, 1893, tumor in right nostril pressing against septum and middle turbinate, the left filled by posterior growth and occluding middle meatus. In naso-pharynx it is broadly attached to the vault and sphenoid body and fills the left choana and most of the right. The right eye is bulging and the right antrum Highmori seems involved. Attempts at removal by scraping, tearing, and snaring failed. Electrolysis reduced pains and exophthalmus. The tumor was a round and giant-celled sarcoma. Aug. 28, 1894, attempt at placing the galvano-cautery snare around the tumor unsuccessful. Seiler's gauze chisel is then worked around the tumor from either nostril and the rest evulsed from the naso-pharynx with large adenoid forceps, whereupon the anterior wall of the sphenoid sinus together with the sphenoid body comes away. The cavity is then scraped post-nasally and through the anterior nares with the sharp spoon. Sept. 12th, free breathing established. October 27th, the tumor is of the same size as before operation. The nose is now split in median line to the tip, the nasal bones are separated from their maxillary attachment, and the posterior nares plugged. The masses are removed from the nasal cavity, and the ethmoidal cells and sphenoidal sinuses are cleared out. Patient made a good recovery. In May, 1894, the tumor had recurred more in the right side. By Dieffenbach's incision the right superior maxilla was exposed, the bone separated and broken down. The eye was removed. The dura mater was found exposed by the tumor extending through the superior orbital plate. Rapid recovery. January 16, 1895, growth had rapidly increased, filling right maxillary cavity, cheek, orbit, and external auditory canal and behind angle of jaw. Toxines of erysipelas and bacillus prodigiosus of no avail. The pharynx was then filled out down to epiglottis and the masses protruded out of the side of the neck. Death, June, 1895. No autopsy.

CASE 2. Aged twenty-seven, after removal of polypi from left nostril, face became swollen and exophthalmus more marked.

Nov. 20, 1895, an incision was made in a line from lower part of nose to the eye. The outer wall of Highmore's antrum removed, the antrum, sphenoidal cells, and orbit curetted. Four days later, erysipelas and abscess; after three weeks otorrhœa. January 15, 1896, recurrence of growth. Death after six weeks.

CASE 3. Aged sixteen. Abscess in left temple near the eye, right eye pushed forward. After subsidence of abscess, swelling in the region of Highmore's antrum, protruding into cheek and mouth. Abscess healed. Offensive odor from right nostril, which was occluded by dense mass, pushing the septum over to the left. Round-celled sarcoma. Operation refused.

CASE 4. Girl, aged seventeen. Feb., 1893, left nostril occluded by dense tumor, pushing the septum over to the right and extending from the vestibule to posterior edge of vomer. Myxo-sarcoma. It is removed through the nostril with snare and sharp spoon, the external nasal wall destroyed, the maxillary antrum exposed, and the ethmoidal cells implicated. Curettement. The patient is free for six months. November, 1893, naso-pharynx is obstructed, recurrence in sphenoidal regions and nasal cavity. After incision in median line, all sinuses, except the frontal, are curetted. The patient is in good condition for a year. Sudden rapid recurrence of large extent, also into both orbits. She died from asphyxia due to extension of the tumor into the larynx. No autopsy.

M. TOEPLITZ.

73. GLASGOW'S patient, a female, aged twenty-two, presented a so-called bleeding polypus in the left nostril of the size of a hazel-nut at the locus Kiesselbachii, which was removed with the cold snare, but returned to the same size in five months. Cauterization with chloracetic acid after second removal cured the condition permanently. It was an angio-myxo-fibroma.

M. TOEPLITZ.

74. The frequency of polypi in the nose is due to hypertrophic catarrh and pus, which produces granulation tissue, and, from it, polypi, identical with the œdematous nasal fibroma. The development is minutely described, as it is observed on the middle turbinal from the beginning granulation tissue, while in the septum it becomes cicatricial. The pendulous, white hypertrophies on the inferior turbinate region are denser, containing more fibrous tissue, glands, and blood-vessels. The polypi are due to inflammation and hypertrophy of the mucous membrane, and finally depend upon the constitution of the individual.

They are a symptom, not a disease. In extensive growths the periosteum becomes involved, and later the bone itself, which finally is rarefied. There exists a proliferating ostitis or, in some instances, the opposite, viz., a rarefying ostitis. The inferior end and sometimes the larger portions of the middle turbinate body, therefore, ought to be removed.

M. TOEPLITZ.

75. BALL's patient, a woman, aged twenty-five years, complained of epistaxis and obstruction of the nose on the left side for three or four months; both symptoms noticed for two or three months on both sides. No pain. On examination each passage found to be blocked almost completely by a smooth pinkish mass presenting in the upper part of vestibule, and attached to cartilaginous septum. Left ala turned up, and growth removed, with certain amount of cartilaginous septum, by Swinford Edwards. Tumor size of walnut.

ARTHUR CHEATLE.

f.—FOREIGN BODIES.

78. CARRUTHERS, S. W. Removal of foreign body from the nose after twenty-three years. *British Med. Jour.*, Feb. 12, 1898.

79. SIMONSON. A case of foreign body in the nose. *Deutsche med. Wochenschr.*, No. 6, 1898.

80. MARKUSE. Foreign bodies in the nose. *Deutsche med. Wochenschr.*, No. 6, 1898.

78. CARRUTHER's patient was a woman, aged thirty years, who fell down at play when seven years of age, and on rising felt there was a stone in her nose. Symptoms had been present ever since: occasional epistaxis; free muco-purulent discharge which was occasionally fetid, and the feeling of something in the nose, with pain on hard blowing. At eleven years of age a polypus was removed, and again at thirteen years and twenty-seven years. One day, after stooping and blowing, the stone was felt to shift its position more than usual, and was then removed.

ARTHUR CHEATLE.

79 and 80. SIMONSON removed a piece of sponge from the nose of a girl, four years old; MARKUSE, a barley grain from the nose of a patient. In both cases a fetid discharge from the nose was present.

NOLTENIUS.

g.—OTHER AFFECTIONS OF THE NOSE.

81. GOODALE, J. L. An etiological study of atrophic disease of the upper air passages, based upon an examination of 200 cases. *Four. Amer. Med. Assoc.*, Feb. 26, 1898.

82. HECHT, H. Ozæna. (Göttingen Ear Clinic.) *Münch. med. Wochenschr.*, No. 7, 1898.

83. SCHEIER. Diphtheria of the nose. Reprint of the *Bibliothek der gesammten medic. Wissenschaften*.

84. SCHEPPEGRELL, W. Case of recurrent headache, each attack being relieved by the discharge from the cranial cavity through right nostril. *Four. Amer. Med. Assoc.*, Feb. 26, 1898.

85. BABER, CRESWELL. Nasal hydrops. Analysis of liquid. *Proceedings of the Laryngological Society of London*, Jan. 12, 1898.

86. SPENCER, W. G. Trigeminal neuralgia relieved by turbinectomy. *Proceedings of the Laryngological Society of London*, Jan. 12, 1898.

87. WILLIAMS, P. WATSON. Formative osteitis (leontiasis ossium). *Proceedings of the Laryngological Society of London*, Jan. 12, 1898.

88. GRADENIGO. A case of congenital bone occlusion of the right choana. *Ann. des mal. de l'or., du lar.*, xxiv., 3.

81. GOODALE classifies the genuine cases of atrophic rhinitis into the non-fetid, fetid, and pharyngeal atrophy. He arrives at the following conclusion: both fetid and non-fetid atrophies are more than twice as common in females than in males, while pure pharyngeal atrophy occurs with nearly equal frequency in both sexes. Both fetid and non-fetid atrophy begin mostly between the ages of five and fifteen, while the pure pharyngeal form was not found before twenty, and occurred regularly from that age up to seventy-two. In four per cent. of the non-fetid and in twenty-six per cent. of the fetid cases, the atrophic symptoms were increased during the catamenia. In all forms three quarters of the cases showed good health. Distinct hypertrophy of the neighboring portions of the nasal mucous membrane occurred only in isolated instances among the fetid and non-fetid cases, while among the pharyngeal cases it was found in about half of the total number. Hypertrophy of the pharyngeal tonsil occurred in twenty per cent. of the non-fetid, in seven per cent. of the

fetid, and in ten per cent. of the pharyngeal atrophies. Hypertrophy of the faucial tonsils was observed with equal frequency among the three forms, viz., in about twenty per cent.

M. TOEPLITZ.

82. After a discussion of the etiology and especially of the bacteriology of the subjects, two cases are described which were treated with copper electrolysis and the nasal douche. In the severe cases there was no noteworthy result, in the milder case there was some improvement, which persisted after two months.

SCHEIER.

83. SCHEIER describes a primary and a secondary form of nasal diphtheria. In 262 cases of diphtheria the nose was affected in 50, of which 38 terminated fatally. (It is not stated whether these had been treated with the antitoxin.) The treatment consists in general treatment (serum therapy) and the most careful removal of the membrane and cleansing of the nose. The irrigation should be gently done with a rubber bulb every two to four hours. The removal of the membrane in the 50 cases observed by Scheier was followed by severe hemorrhage, necessitating packing. Especially with the serum therapy active local treatment should be avoided, as the irrigations are very apt to set up an otitis media. During the serum therapy the membrane comes away very soon of its own accord.

H.

84. The patient, a sister of a religious order, suffered from agonizing headaches, which occurred in attacks lasting from three to four days, recurring in less than two weeks. During one attack she fell down a flight of stairs, striking the head against a stone jar, became unconscious, and when revived, found the headache disappeared after a discharge of yellow watery fluid from the nostrils, which also returned at the end of each successive attack. Opening of the sphenoid, frontal, and ethmoidal sinuses and catheterization of Highmore's antrum was of no avail. The examined fluid resembled the cerebro-spinal fluid and the contents of the cranial lymphatic vessels. SCHEPPEGRELL believed the condition to be due to a cyst connected with the efferent vessel of the perivascular lymphatics surrounding the vein passing through the foramen cœcum from the nose to the longitudinal sinus.

M. TOEPLITZ.

85. BABER's case was as follows: A married lady, aged forty-two years, complained of a profuse non-fetid watery discharge from the right side of her nose. Five years before, after eight

months' excessive watery discharge following influenza, she had had a polypus removed; the secretion then stopped, but returned at Christmas, 1896, after another attack of influenza. A polypus was removed in May, 1897, but the discharge continued. When first seen by Baber on June 16, 1897, there was no obstruction, very little sneezing, no pain, only the profuse discharge which continued night and day. The right side was much narrowed by deflection of the septum, and the mucous membrane sodden and catarrhal in appearance. No polypus, but a little irregularity on the middle turbinated body. Transillumination showed both infra-orbital regions light, and nothing came out of the right antrum on laying down the head. The fundus was normal in both eyes. No loss of sensation in the right nasal cavity. Spirit and cocaine spray was tried, but without effect; the dripping of watery fluid continued constant, and on one occasion (July 17th) 70 cc were collected in five minutes. On this date the constant current (eight cells) was applied externally to the nose. This stopped the secretion for a few minutes. Patient was ordered to use it for five minutes twice a day. In a week's time (July 24th) she reported that the running was rather less in the mornings.

A small piece of projecting mucous membrane was snared from the middle turbinal, but only proved to be hyperplasia of normal tissue. A 20 per cent. solution of menthol in paroline was ordered to be sprayed into the nose twice a day, in addition to the constant current applied externally. Sept. 15th, patient reported that a month previously the running began to diminish, and had got so much less that she only used two handkerchiefs a day instead of twelve. Treatment continued. Oct. 5th, no watery discharge at all for last four days. Much less swelling of the mucous membrane. Used spray and galvanism once a day for three weeks. Nov. 3d, no discharge at all since last visit. Treatment omitted. On Jan. 3d, 1898, reported no return of the trouble.

Examination of one ounce of the fluid was sent to the Clinical Research Association for report.

	Per 100 cc.	
Organic solids.....	0.160	gramme
Containing mucin.....	0.060	"
" proteids	0.025	"
Undetermined	0.075	"
	0.160	"

	Per 100 cc.	
Inorganic solids.....	0.880	gramme
Containing sodium chloride.....	0.770	"
" calcium phosphate, etc...	0.110	"
	0.880	"

Microscopical examination showed the presence merely of a few squamous epithelium cells and a few leucocytes.

Baber thinks that, from the absence of head symptoms, and especially from the beneficial effect of the constant current, the liquid in this case was simply an excessive secretion from the nasal mucous membrane, and not an escape of cerebro-spinal fluid.

ARTHUR CHEATLE.

86. SPENCER'S case was that of a man, aged forty-six. In April, 1897, after an attack of influenza, he was suddenly seized with severe pains in the face; the neuralgia involving all the branches of the fifth nerve. Opium and morphine in large doses gave some relief. A speculum could not be inserted into the left nostril, on account of hyperæsthesia, until he had been given an injection of morphine. The interior of the left nose showed no definite disease, but on touching the anterior part of the middle turbinal a severe paroxysm of pain and itching was set up; after applying 20 per cent. cocaine this part could be touched without producing the symptoms. The middle turbinal was removed. Nothing abnormal was present in the tissue removed. No pain since operation, but has at times itching in the distribution of the terminal ends of the fifth on the face and at the back of the eye and nose.

ARTHUR CHEATLE.

87. WATSON WILLIAMS showed a specimen of the septum nasi and a portion of the frontal and left malar bones from a man, aged forty-six years. There was no history of syphilis, and no known cause for the disease.

Post-mortem examination.—Large, smooth bony thickenings on either side of the nose, and a smaller boss on the left side of the forehead. On removing the cranium pus was found between the dura mater and the bone over the frontal lobe, the pus apparently having come from the left sinus which was full. The frontal sinus on the right side was obliterated by soft cancellous bone. The nose showed that the sphenoidal sinus and ethmoidal cells were entirely obliterated by cancellous bony growths. The

cavity on the left side was almost entirely filled up by growth from the septum. The antra of Highmore were apparently completely filled up by cancellous bony formation. ARTHUR CHEATLE.

88. In a man of eighteen years, post-rhinoscopically, a reddish funnel-shaped membrane was seen to completely occlude the right nasal passage 1 cm in front of the choana. The two choanæ were alike, the right half of the soft palate was somewhat dependent. Deafness was present on the right side, due to catarrh of the Eustachian tube; no loss of smell, and no hyperæsthesia. The occlusion was perforated with a trocar, and the opening was packed. Treatment not concluded.

ZIMMERMANN.

h.—NASO-PHARYNX.

89. HESSLER, Prof., Halle. On the time of operation and the various methods of removing the pharyngeal tonsil and the palatal tonsils in acute otitis media. *Monatschr. f. Ohrenheilk.*, No. 2, 1898.

90. MOURE. Adenoids in adults. *Rev. hebdom. de lar., d'otol.*, xix., 5.

91. DENKER. A new instrument for the removal of adenoid vegetations. *Arch. f. Ohrenheilk.*, 1898, vol. xlv., p. 97.

92. ARDENNE. Chronic abscess of the vault of the naso-pharynx. *Rev. hebdom. de lar., d'otol.*, xix., 7.

93. MUSSON, E. E. Observations on some pathological conditions of the naso-pharynx. *Four. Amer. Med. Assoc.*, March 5, 1898.

89. HESSLER recommends the early removal of the adenoids in cases of acute otitis media, *i. e.*, when the inflammation is abating.

KILLIAN.

91. An instrument like a pair of scissors with a web-like arrangement to catch the fragments. The remnants are then removed with the finger. Subsequent irrigation with borated solution for a month.

BLOCH.

92. An otherwise healthy man suffered from stenosis of the nose for one year. The nasal passages appeared normal; the septum was slightly deflected. The soft palate, of usual color, was pushed forward. A round, smooth red tumor occupied the naso-pharynx, and was attached above and to the sides. On palpation, greenish pus was evacuated. The abscess-cavity was

enlarged, irrigated, and the patient recovered. On microscopic examination there were no evidences of tuberculosis or bone necrosis, and the abscess was supposed to have formed in an occluded follicle.

ZIMMERMANN.

93. The first group of cases comprises 34 patients with hypertrophy of Luschka's tonsil taken from the last 230 cases of the office. Their ages were from fifteen to forty years. The second group of seventeen cases showed a marked change in the ratio between uric acid and urea excreted. The third group were cases of acute follicular naso-pharyngitis concomitant with acute lacunar tonsillitis. In 50 per cent. there was congestion of Luschka's tonsil with follicular exudate, in 40 per cent. of the remaining cases, congestion without it. The three appended cases represented: (1) a purulent inflammation of the naso-pharynx, appearing in a student of the bacteriological laboratory, twenty-four hours after he had broken a test-tube with a culture of streptococci; (2) a purulent inflammation of the naso-pharynx followed by empyema of both frontal sinuses and the left antrum Highmori in a patient just recovered from acute rhinitis, contracted from opening cases of ostrich feathers in a raw state; and (3) acute adenoiditis in a physician exposed to diphtheria or acute pharyngitis.

M. TOEPLITZ.

i.—SOFT PALATE, PHARYNX, AND MOUTH.

94. SPENCER, W. G. Separation of old-standing adhesion of the soft palate to the pharynx. *Proceedings of the Laryngological Society of London*, Nov. 10, 1897.

95. KELLY, A. B. Large pulsating vessels in the pharynx. *Glasgow Med. Four.*, Jan., 1898.

96. RICHARDSON, C. W. Chronic abscess of the tongue. *Four. Amer. Med. Assoc.*, Feb. 26, 1898.

97. FREUDENTHAL, W. Salivary calculi. *Four. Amer. Med. Assoc.*, Feb. 26, 1898.

98. PLICQUE. Pharyngeal tuberculosis in children. *Ann. des mal. de l'or., du lar.*, xxiv., 3.

99. GOODALE, J. L. The absorption of foreign bodies by the palatal tonsils in relation to the development of infectious processes. *Arch. f. Laryngol.*, vii., 1.

100. PELTESOHN, F. Angina and rheumatism. *Arch. f. Laryngol.*, vii., 1.

94. A syphilitic middle-aged woman; soft palate completely united to back wall of pharynx. Great pain in ears and over mastoid processes; and collection of muco-pus which could not be expelled through the nose. SPENCER detached the soft palate, which was then drawn forwards and fixed by two silk sutures to the muco-periosteum of the hard palate. Sutures cut out in about a week. Separation then kept up by passing full-sized nasal bougies, and by stretching the soft palate by means of an aneurism needle under cocaine. Pain in ears lost. Breathing through and blowing of nose easy. ARTHUR CHEATLE.

95. KELLY relates four cases. In two, a man aged seventy-five years, and a woman aged seventy-two years, the condition was exactly similar. A large pulsating vessel projected from the angle between the posterior and right lateral walls of the pharynx; it emerged from the posterior wall about the level of the upper border of the epiglottis and ascended vertically, becoming gradually more prominent. When opposite the upper part of the tonsil, where its convexity was most marked and its pulsation best seen, it curved outwards and disappeared in the tissues at the side of the naso-pharynx. The vessel was as thick as a pencil, and extended laterally over a considerable part of the posterior wall of the pharynx. Pressure over the large vessels on the right side above level of the upper border of the thyroid cartilage checked pulsation.

In the third case, a man aged seventy-two, a large vessel emerged from the left half of the posterior wall of the pharynx on a level with the attachment of posterior pillar, and curved upwards and outwards, passing behind the upper part of the pillar.

In the fourth, a woman aged twenty-two, there was marked pulsation behind both posterior faucial pillars. The condition caused no symptoms in any of them. Perry saw Cases 1 and 4, and reported the vessels in both corresponded to the convexity of an abnormal bend of the internal carotid. Kelly thinks Cases 1, 2, and 4 were of this nature, and as a possible embryonic origin has not been made out, he thinks the condition to be a change associated with advance in life.

Reference is made to the importance of the condition as regards tonsillotomy and incising for peritonsillar abscess.

ARTHUR CHEATLE.

96. The first case occurred in a clarionetist, aged twenty-three, with abscess under the tongue, in which the stone was

found in the duct, and after its evacuation another in the substance of the submaxillary gland. The second patient, aged forty-five, presented a steadily growing swelling under the tongue of two and a half years' duration. The removal was declined by the extremely stout and alcoholic patient, who died several weeks later from suffocation. The majority of stones grow around a foreign body. In a third patient, aged fifty-seven, a small piece of wood was found in the centre of the stone. The patient had been in the habit of chewing toothpicks. Stones may be washed out by salivations with pilocarpine. The submaxillary gland is more frequently the seat of calculi, owing to the more adhesive qualities of the mucin contained therein.

M. TOEPLITZ.

97. A girl, aged eighteen, presented in the centre of the dorsum linguæ anterior to the papillæ circumvallatæ an oval elevation, which had been noted since early childhood. It caused no disturbance, and was considered as a cyst. Ten days after the discharge of the patient from treatment, intense earache, soreness in lateral walls of pharynx, pain by pressing upon the tumor set in, which, when opened, evacuated several drachms of very offensive, thin, watery pus. Complete recovery.

M. TOEPLITZ.

98. PLICQUE reviews the two principal forms of pharyngeal tuberculosis in children: the primary, progressive ulcerous, and the secondary form with the formation of a fibrinous pseudo-membrane.

ZIMMERMANN.

99. The author injected the lacunæ of hypertrophic tonsils with a carmine solution. The tonsils were then removed, fixed in sublimate, and examined in serial sections. The interval between injection and operation varied from twenty minutes to ten days. Conclusions: (1) Absorption takes place normally in tonsils and through the mucous membrane of the lacunæ. (2) The absorbed material passes through the follicular lymph spaces in the direction of the larger connective-tissue bundles. (3) During the process of absorption the foreign particles are subjected to the phagocytic action of the multi-nuclear neutrophiles which are situated near and in the mucous membrane. (4) Bacteria are normally to be found in the lacunæ, though cannot generally be demonstrated in the tonsillar tissue.

ZARNIKO.

100. This is a complete and well written review of this subject which has frequently been discussed of late. The following

conclusions are reached: angina lacunaris, acute articular rheumatism, muscular rheumatism, and some of the accompanying skin lesions are allied diseases with a more or less similar etiology. They are caused by microbes, presumably attenuated bacteria of pyæmia. The infection is aided by certain diseased conditions of the nose and the throat. Unfavorable social and hygienic conditions, bad ventilation and drainage, low water-level, diminished alkalinity of the blood, exhaustion, and constipation aid.

ZARNIKO.

BOOK NOTICE.

The Year-Book of Treatment for 1898. A Critical Review for Practitioners of Medicine and Surgery. Philadelphia and New York : Lea Brothers & Co.

This is the fourteenth annual issue of an English review, introduced in this country by the above firm. It is a compilation of the annual progress in therapeutics on 484 small-octavo pages, concisely but well printed, with indexes of authors and subjects. The different chapters are entrusted to men of established reputation. The extracts of the original publications are succinct, but not meagre, and embrace a very wide field, not only remedies and operations, but constant references to diagnosis and indications, and not without fearless criticism; for instance, on page 170 we find the following: "*Asepsis usque ad absurdum!*" The latest development of the aseptic craze hails from Breslau, where Mikulicz now operates in gloves, and with a wet towel tied over the lower half of his face, similar precautions being also insisted on for his assistants," etc.

The book should not only be recommended to the general practitioner, but to the specialist, who has a particular need of such an annual reminder of the progress in the principles and applications of the additional means of healing the sick, in order to be prevented from slipping into narrow specialism. Eye and ear surgery have their particular chapters in the book, but very valuable contributions on both are found also in other chapters: for instance, Leutert's excellent article on Lumbar Puncture in the Complications of Ear Disease is in the chapter on nervous disease, page 61; Landolt's article, "Obstruction of the Lachrymal Duct in

New-born Children" (published in the *Annales de Gynécologie et d'Obstét.*), is in the chapter on midwifery. By the way, the reviewer begs to differ with his colleague and friend, Landolt, who "advocates sounding of the duct with a fine probe; on no account should the canaliculus be slit." The probing is not only very troublesome, if at all possible, but perfectly superfluous, as according to the reviewer's experience the lachrymation and inflammation disappear when the tear duct in the natural development of the cavities of the skull attains its proper calibre. The chapter on mastoid disease and its complications is, as in previous years, particularly good. The full extract, or rather the whole, of Prof. Panas's learned paper, "Auto-Infection in the Eye," should not only be read by ophthalmologists, but by the general practitioner, as it gives a very lucid exposition, illustrated by the behavior of so delicate an organ as the eye, of a general principle of pre-eminent scientific and practical importance. Altogether the reviewer's opinion is that the *Year-Book*, or something similar to it, fairly complete, yet not too bulky, should not only be in the hands of, but read by, every practitioner, general or special. H. K.

edies, and instruments, and to discuss in a progressive, yet conservative spirit all questions of present importance.

The ARCHIVES contain exclusively original papers on all branches of Ophthalmic and Aural Surgery, and original reports on the progress of Ophthalmology and Otology throughout the world. The original papers occupy about three-fourths of the space, and their scope embraces all subjects of scientific and practical interest in the departments of Ophthalmology and Otology.

Special attention is paid to the preparation of the Reports on the Progress of Ophthalmology and Otology. These Reports are intended to furnish *complete, systematic, and early reviews* of the current Ophthalmological and Otological literature of the world, and the work of preparing them is divided among a specially selected number of collaborators.

Under the heading of "Miscellaneous Notes" there will be published all kinds of professional news that concerns the Oculist and Aurist, *e.g.*, appointments, honors, resignations and vacancies, new ophthalmic and aural hospitals, prize questions and essays, announcements of Society meetings, etc.

Each volume contains besides a specified table of contents, an index of subjects and authors, both of the original papers and the reports, and a general index of the preceding seven years is added to every seventh volume.

Original papers of value from any source are solicited.

Communications for the English edition of the ARCHIVES OF OPHTHALMOLOGY should be addressed to DR. H. KNAPP, 26 West 40th Street, New York, those for the ARCHIVES OF OTOTOLOGY either to DR. H. KNAPP, or to DR. U. PRITCHARD, 26 Wimpole Street, W., London, England.

G. P. PUTNAM'S SONS, Publishers

NEW YORK

LONDON

27 & 29 WEST 23D STREET.

24 BEDFORD ST., STRAND.

PUBLISHER OF THE GERMAN EDITION

I. F. BERGMANN

20 Schwalbacher Strasse, Wiesbaden.

EDITORIAL NOTE.

In asking for continued support of the ARCHIVES from subscribers and contributors, the Editors offer no new program, but point to the record of the work that has been accomplished during the past twenty-eight years. At the first appearance of the ARCHIVES in 1869, they constituted the only periodical of their class in America, and had only a few predecessors in Europe. The international character of the ARCHIVES was a novel and distinctive feature.

The original program of the ARCHIVES to publish only original papers in semi-annual independent numbers has, in the course of years, been extended by the addition of reviews of the current ophthalmological and otological literature.

With the eighth volume, in 1879, the combined ARCHIVES, issued semi-annually, were divided into two separate journals, issued quarterly, and each of about the same size as the combined journal, and the reviews were converted into quarterly reports, systematic and comprehensive, though concise, on the progress of ophthalmology and otology.

Since that date, the ARCHIVES have developed into an extensive and conveniently arranged storehouse of knowledge for the instruction of the student and for reference by the practitioner and the investigator.

For more than ten years, the valuable material offered to the ARCHIVES has been so abundant that it has not been practicable to utilize for the English edition the full series of papers from the German, or the converse. Many articles had to be abridged, while of others abstracts only could be printed. Any one of our readers could, however, have secured, and can secure in future, from the American editor, or the German publisher, the loan of the original papers presenting the complete text.

It is the purpose of the editors to arrange, in the department of Reports, for the review of every publication which in their opinion contains material that can be called distinctive and important. It is, of course, impossible, within the limits of the ARCHIVES or of any similar journal, to give attention to every publication in their department of science. We may state further that it is not a part of our program to furnish a complete report on the *bibliography*, but only on the **progress** of ophthalmology and otology.

Though the systematic arrangement of the reviews is of importance for reference and comprehensive information, we shall publish, as early after the meetings as practicable, reports of the proceedings of societies, always bearing in mind that the ARCHIVES are not intended to be only a repertory of knowledge, but also a journal of news.

It is natural that the English edition of the ARCHIVES should give the advantage of time and space to Anglo-American contributors over the German, and *vice versa*. It is evident, however, that the association of the two editions lends strength to each, furnishing to the authors a wider circulation for their papers, and to the readers a larger and more diversified field of information.

NOTICE TO CONTRIBUTORS.

The editors and publishers of the ARCHIVES beg to offer some suggestions to authors who propose to favor them with their contributions.

1. As original communications the ARCHIVES can accept only such papers as have never been printed nor are intended to be printed in other journals. If a preliminary communication on the subject of a paper has been published, the author is requested to state this in the letter accompanying his manuscript. It is understood that contributors to these ARCHIVES and editors of other periodicals will make no abstracts of the original papers published in this journal without giving it due credit for the same.

2. Authors will receive gratuitously twenty-five reprints of their articles. If a greater number is desired,—notice of which should be given at the head of the manuscript,—only the additional cost of presswork and paper will be charged to the author.

3. In preparing manuscript for the compositor it is requested that the following rules be adhered to :

a. Write on one side of the paper only.

b. Write without breaks, *i. e.* do not begin a new sentence on a new line. When you want to begin a new line or paragraph at a given word, place before it in your MS. the sign ¶.

c. Draw a line along the margin of such paragraphs as should be printed in smaller type—for instance, all that is clinical history in reports of cases, etc.

d. Words to be printed in *italics*, should be underscored once, in SMALL CAPITALS twice, in LARGE CAPITALS three times.

4. Authors may receive proofs for revision if they will kindly return them without delay. We beg however to remind our contributors that changes in the copy are equivalent to resetting, causing so much additional expense. We therefore request them, to make, if possible, no alterations at all in their MSS., or, at least, to limit these to what is of essential importance.

CONTENTS OF VOLUME XXVII., NUMBER 5.

	PAGE
1. Escape of Cerebro-Spinal Fluid through the Nose, in Conjunction with Atrophy of the Optic Nerves, Probably Caused by the Perforation of the Wall of the Sphenoidal Sinus by a Tumor of the Hypophysis. By Prof. O. Körner , Rostock, Germany. Translated by Dr. EDW. PREBLE, New York	397
2. Two Cases of Pachymeningitis Externa and Extradural Abscess Occurring in Acute Mastoid Disease. By Dr. Hermann Preysing (Assistant). Translated by Dr. E. PREBLE, New York	404
3. Two Cases of Mastoid Disease of an Uncommon Character. By Robert Lewis, Jr. , M.D., New York	409
4. The Onset of Inherited Syphilitic Deafness. By Urban Pritchard and Arthur Cheatle	415
5. The Most Important Cases of Middle-Ear Suppuration Treated in the Military Hospital at Warsaw in the Year 1896. By Dr. Th. Heiman , Warsaw, Russia. Translated and Abridged by Dr. EDWIN M. COX, New York	421
6. On Cartilaginous Interglobular Cavities in the Capsule of the Human Labyrinth. By Dr. Paul Manasse , Strassburg. Translated by ADOLPH O. PFINGST, M.D., Louisville, Ky. (With Plates I. and II. of Volume XXXI. of German Edition)	438
7. The Affections of the Ear in Acute and Chronic Bright's Disease. By Dr. J. Morf , Winterthur, Switzerland. Abridged and Translated by Dr. ARNOLD H. KNAPP, New York	444
8. Chloroma in the Temporal Region. By Prof. O. Lubarsch , Rostock, Germany. Translated by ADOLPH O. PFINGST, M.D., Louisville, Ky.	450

	PAGE
9. Report of the Seventh Meeting of the German Otological Society at Würzburg, May, 1898. By Dr. Seligmann , of Frankfort-on-the-Main. Translated by Dr. JAS. A. SPALDING, Portland, Me.	459
Scheme for uniformity in testing the hearing of the diseased ear. By Barth, Leipzig, 459.	
On a uniform nomenclature for the results obtained by testing the functions of the ear. By Bloch, Freiburg, 460.	
Determination of the hearing in correct proportions. By Bezold, 460.	
Acoustic communications for solving physiological and practical questions in otology; demonstration of apparatus and methods. By Dennert, 460.	
On the theory of hearing. By Beckmann, 461.	
Otology and deaf-mutism. By Passow, 461.	
The development of the labyrinth in the <i>Torpedo ocellata</i> . By Hellmann, 462.	
On the reflex excitability of the tensor tympani by waves of sound. By Ostmann, 462.	
Tuberculous tumor of the auricle. By Strauss, 462.	
Otitis media in infants. By Hartmann, 463.	
I.—Apparent embolic affection of the ear; II.—Ocular paralyses and middle-ear suppuration; III.—Anchylosis of the stapes, with exhibition of a specimen. By Habermann, 463, 464.	
Secondary labyrinthine alterations in primary epithelial carcinoma of the middle ear. By Manasse, 464.	
An intratympanic tumor. By Jansen, 464.	
I.—Sequestrum containing the facial canal; II.—Acute middle-ear suppuration with rupture through the labyrinth into the cavum cranii. By Panse, 465.	
Rupture into the inner ear in acute middle-ear suppuration. By Scheibe, 465.	
Demonstration of anatomical and pathological conditions in the ear. By Katz, 466.	
I.—Neoplasm on the auricle; II.—Treatment of otitis externa acuta. By Haug, 466.	
On the relation of hypertrophied pharyngeal tonsil to tuberculosis. By Brieger, 466.	
Melancholia as the result of an otitic extradural abscess. By Biehl, 467.	
Tinnitus aurium. By Panse, 468.	
Experimental investigations on massage of the ear. By Ostmann, 468.	
The operative treatment of stapes anchylosis. By Noltenius, 468.	
A case of isolated thrombosis of the bulb of the jugular vein; and a case of sinus and jugular-vein thrombosis. By R. Hoffmann, 468.	
On the treatment of stapes anchylosis. By Dundas Grant, 469.	
Malignant tumors after chronic middle-ear suppuration. By Kirchner, 469.	
Transplantation of skin in the radical operation. By Jansen, 469.	
Injuries to the ear from detonating balls. By Wagenhäuser, 469.	
Demonstration of instruments. By Beckmann, 469.	
10. Miscellaneous Notes	470
11. Contents of the Latest Numbers of the German Edition of these ARCHIVES (<i>Zeitschrift für Ohrenheilkunde</i>)	472